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### *Original Articles*

#### THE VALUE OF RADIOGRAPHY IN THE SURGERY OF THE URINARY TRACT.\*

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The diagnosis and treatment of surgical lesions of the urinary tract have been completely revolutionized through the use of the cystoscope, the ureteral catheter and radiography. The general surgeon can no longer afford to remain ignorant of and fail to utilize these diagnostic aids. Even the internist and general practitioner must be familiar in a less detailed manner than the surgeon, with the more important data furnished by these methods.

In presenting to you the many advantages which radiography of the urinary tract has conferred upon us, I shall attempt to treat the subject in as non-technical a manner as possible. When the X-Ray apparatus is employed alone it is called a "simple radiograph." When, on the other hand, we employ a solution such as collargol capable of giving a shadow of the ureter and renal pelvis, or insert into the ureter a catheter impregnated with lead or bismuth capable of casting a shadow, we speak of "combined radiography." (Figures 3, 4 and 5).

#### PREPARATION OF THE PATIENT.

In no other region is a preparation of the patient so necessary as in radiographs of the urinary tract. The routine method employed at the Michael Reese Hospital is as follows: No drug opaque to the ray should be administered for at least forty-eight hours preceding the examination. On the day preceding the examination the mid-day meal should be as full as is consistent with the patient's condition. Two hours after this mid-day meal, one to two ounces of castor oil is given, two or three evacuations being desired. The evening meal of the day before ex-

amination is very light, such as coffee, toast and one soft boiled egg. A colonic flushing is given one hour before retiring. On the day of the examination a colonic flushing is given about 7 A. M. For breakfast we give only clear tea and coffee and the examination takes place between 9 and 10 A.M. Thus extraneous shadows due to foreign substances in the alimentary tract are at once excluded and one can feel certain that a shadow seen in the course of the urinary tract is either due to a calculus or to one of the extrarenal or extraureteral causes to be enumerated below. We prefer castor oil to a saline cathartic because the latter causes so much gas formation, which clouds the pictures. In order to secure a satisfactory picture it is best to employ a soft tube and lead cylinders of varying diameters, aided by compression of the part to be radiographed. Some form of apparatus like that first suggested by Albers-Shonberg in 1906 fulfills all of these requirements, especially when one uses in addition the loofah-pad of Strater or the rubber balloon-pad in order to exert more localized compression over the kidneys and ureters. A diffuse picture is of value for purposes of general orientation and especially when collargol is injected, but the majority of radiographers who do a large amount of this work prefer to take compression pictures with lead or lead-glass cylinders covering a more circumscribed area. In Europe, Immelman, Haenisch, Haudek and others advocate taking five pictures, one for each kidney and upper ureter, one for each lower ureter, and a fifth one for the bladder. We have found that if a lead-glass cone having an opening of seven inches is used, two pictures, one for the upper and the other for the lower urinary tract (Figure 2) suffice for the thinner patients, especially if the circles overlap somewhat. In stout individuals it is best to take a separate picture of each kidney. Stereoscopic pictures and exposures at different angles are often necessary in order to clear up the nature of a suspicious shadow, especially those seen in the course of the pelvic portion of the ureter. Soft tubes are the best for this class of work, aided by the intensifying screen, the patient's shoulders being raised and the knees flexed so as to

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bring the kidneys and ureters as close to the plate as possible. It is very important to use letters to designate which are the right and left sides respectively of the pictures.

The various conditions which can give rise to

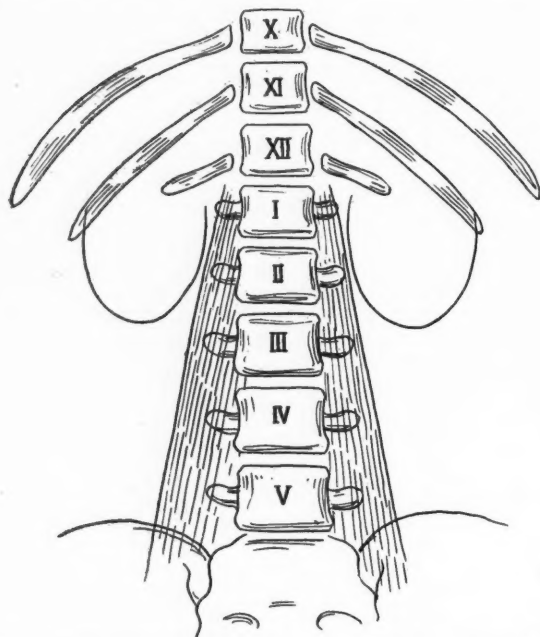


Fig. 1. Necessary qualifications of good skiagraph of both kidneys and upper portions of both ureters. Such a skiagraph must show last two ribs, transverse processes and bodies of all lumbar vertebrae, shadow of psoas muscle. In many pictures the shadow of the lower half of each kidney is visible.

a shadow to be distinguished from one due to a calculus of the kidney or ureter are best divided into:

#### EXTRARENAL SHADOWS.

1. Calcified areas due to tuberculosis of the kidney.
2. Areas of chronic induration of the kidney.
3. Atheromatous patches in the renal artery.
4. Calcified retroperitoneal glands.
5. Areas of ossification in the tips of the transverse processes of the lumbar vertebrae, or in the last costal cartilages or of the last two ribs.
6. Gallstones, pancreatic calculi or calcified areas in a cancer of the head of the pancreas or enteroliths in the appendix.
7. Calcification of ulcerations in the wall of ureter.

#### EXTRAURETERAL SHADOWS.

1. Calcified retroperitoneal or mesenteric glands.
2. Enteroliths in the intestine or appendix vermiformis.
3. Areas of calcification in the sacrospinal ligaments, in myomata of the uterus, in dermoid

cysts, in the ovaries, in the prostate or in the vasa deferentia.

4. Phleboliths in the pelvic veins or areas of calcification in the iliac vessels.

5. Calcification in the wall of the ureter.

To those accustomed to the study of X-Ray plates of this region, the majority of the above causes of error present no difficulty. In many cases, however, it is necessary to take pictures at different angles or to inject a 10 per cent. solution of collargol into the ureter and renal pelvis, or to insert a shadowgraph catheter in order to differentiate a real from a pseudo-shadow (See Figures 3, 4 and 5). A good picture of the upper urinary tract must include (See Figure 2) the 11th and 12th dorsal vertebrae, last two ribs, the bodies and transverse processes of the lumbar vertebrae and the psoas muscle. Good technicians are now able to get the shadow of practically the entire kidney and the details of the psoas muscle on every picture except in very stout individuals and in children.

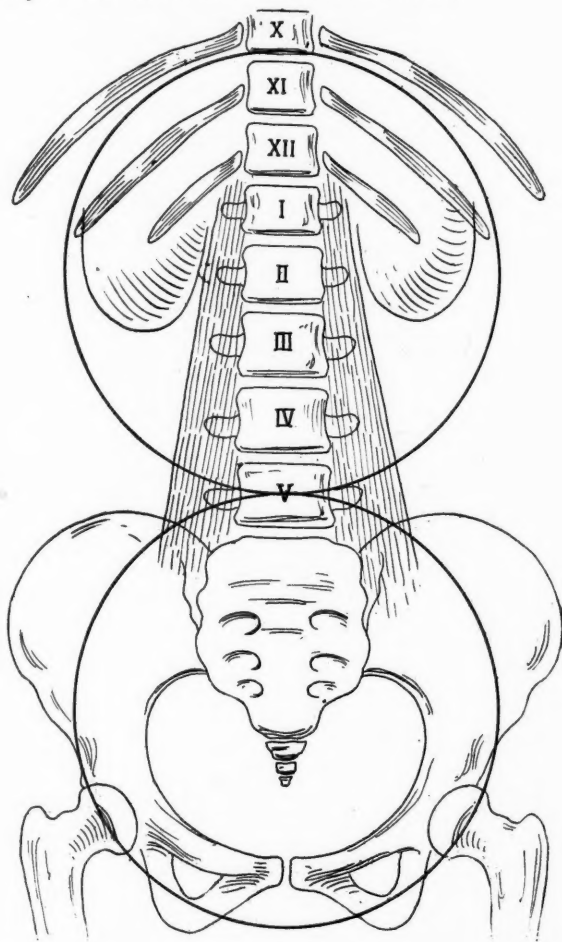


Fig. 2. Diagrammatic representation of areas to be included in two or three skiagraphs of kidneys, ureter and bladder.

Pictures of the lower urinary tract should include the sacral vertebrae, and enough of the ilium to include the course of the iliac ureter and the pubic symphysis and obturator foramina (Figure 2).

## PYELOGRAPHY.

In 1906 Voelcker suggested a method of injecting into the ureter and renal pelvis silver preparations impermeable to the X-Ray in order to study the size, position and form of the renal pelvis and both ureters at the same time. The solutions at present used for this purpose are collargol (5 to 10 per cent.) cargentos and silver iodide (5%). I will not describe here the method in detail nor discuss the bad results in recently published cases following the injection of collargol. I do not believe there is any danger if one first ascertains the capacity of the renal pelvis by injecting methylene blue solution and then does not exceed this quantity when the collargol is employed, using gravity as the only pressure. I shall refer later to the great value of pyelography in the diagnosis of various conditions.

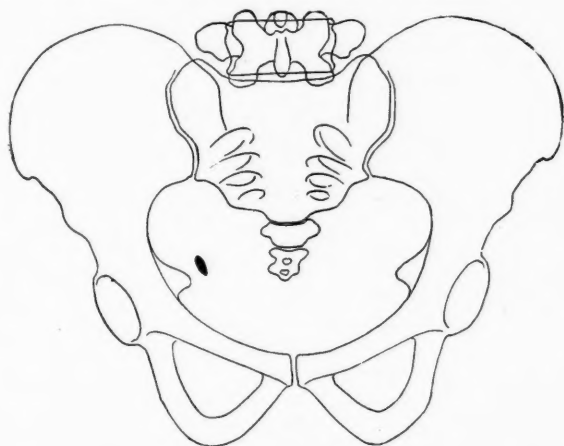


Fig. 3. Shadow of ureteral calculus in pelvic portion of right ureter. (Compare with Figs. 4 and 5).

## USE OF THE SHADOWGRAPH CATHETER.

The introduction of ureteral catheters sufficiently impregnated with bismuth or lead to give a distinct shadow when introduced into the ureters, has completely superseded the lead fuse wire inserted within the ordinary ureteral catheter. The use of these shadowgraph catheters (See Figures 3, 4 and 5) are indispensable in determining whether a shadow is within the kidney or ureter or external to them, and also of the greatest aid in differentiating kidney from other abdominal tumors. I invariably employ, not only for this purpose but for ureteral catheterization, an imported catheter whose wall is impregnated with lead and hence gives a deep shadow, but has the additional advantage that it can be boiled without damaging the material. I have enumerated above the various extrarenal and extraureteral conditions which can give rise to shadows easily mistaken for calculi.

The use of the shadowgraph catheter is indispensable and to operate upon the mere sus-

picion that a shadow is a calculus, if there is any question, is absolutely inexcusable and can result in great embarrassment to the operator. As my experience in this field grows I am becoming more and more careful, especially in the

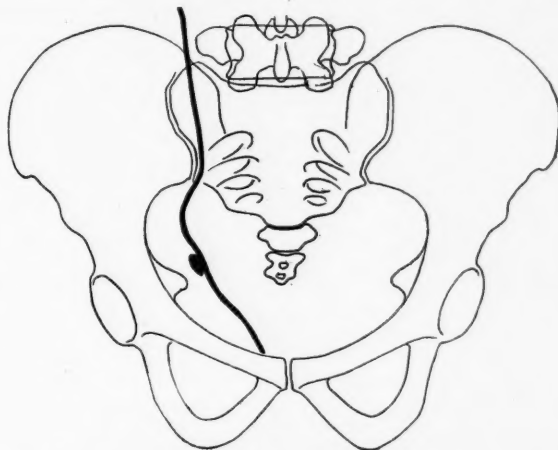


Fig. 4. To show that shadow of a ureteral calculus lies close to a shadowgraph ureter. (Compare with Figs. 3 and 5).

cases showing shadows in the course of the ureter, about not making a positive diagnosis before taking a second radiograph after I have employed the shadowgraph catheter. The cases which are shown in Figures 6 and 7 may be of interest in this connection.

## RENAL CALCULI.

If the shadow of the kidney shows upon the plate, the location of the calculus, i. e., whether it is in the pelvis or the parenchyma of the kidney, is comparatively easy. In our own work we are now able to see the shadow of

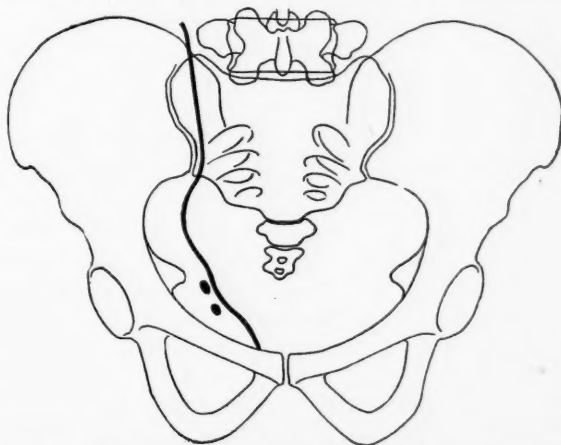


Fig. 5. This shows that extra-ureteral shadows do not lie as a shadowgraph catheter. (Compare with Figs. 3 and 4).

the kidney in the majority of cases, even though the patient be very stout. In the absence of such a kidney shadow we have many other data which tell us not only where a stone is located in the kidney, but also, to some extent, the amount of destruction of the parenchyma.



#### CALCULI AT THE JUNCTION OF THE URETER AND RENAL PELVIS.

These shadows are either oval or show a nipple-like projection and in a normal lying kidney are at the level of and close to the transverse process of the first or second lumbar vertebrae. (Fig. 8). Of course there are exceptions to this but it holds good in the majority of cases, and if the kidney can be brought well out into the incision, we are able to remove

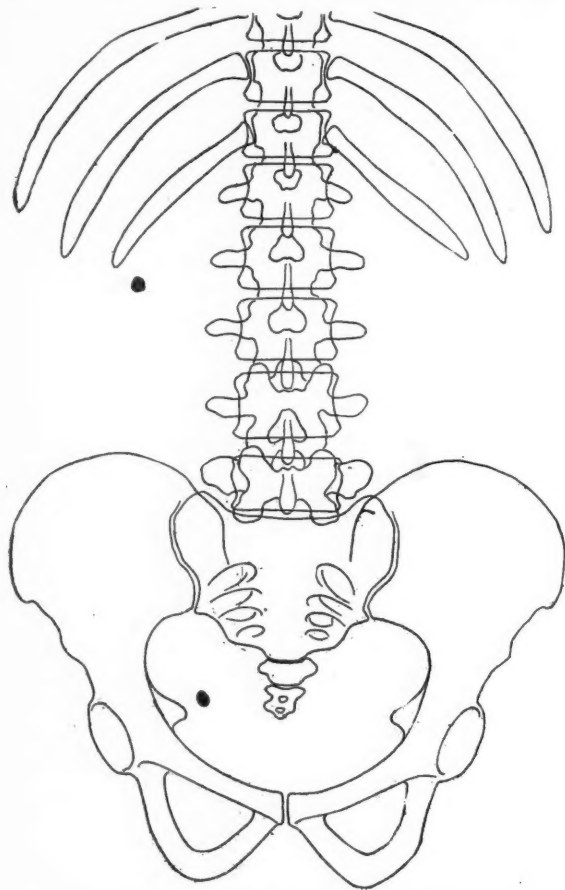


Fig. 6. X-Ray tracing of calculus in pelvis of right kidney and of shadow in pelvic ureter found due to calcified area in ovary (case L E) of same side.

the calculus through a small incision in the posterior aspect of the renal pelvis. This is the easiest and most conservative operation for removing a calculus in the kidney, and the advantages of such a pyelotomy over the older and more dangerous operation of nephrotomy have been fully discussed in my article published in the *Journal of the Amer. Med. Assn.* in 1912.

#### CORAL-LIKE OR BRANCHED SHADOWS. (FIG. 10.)

These usually mean that the entire renal pelvis is filled by a calculus which may be either a single one and have formed a perfect mould or cast of the pelvis, or may be formed by a number of large calculi lying in close relation to each other and filling not only the pelvis proper but also the primary and secondary calyces.

#### SCATTERED MULTIPLE SHADOWS. (FIG. 11.)

The wide distribution of shadows, especially if there is much pus in the urine, usually means

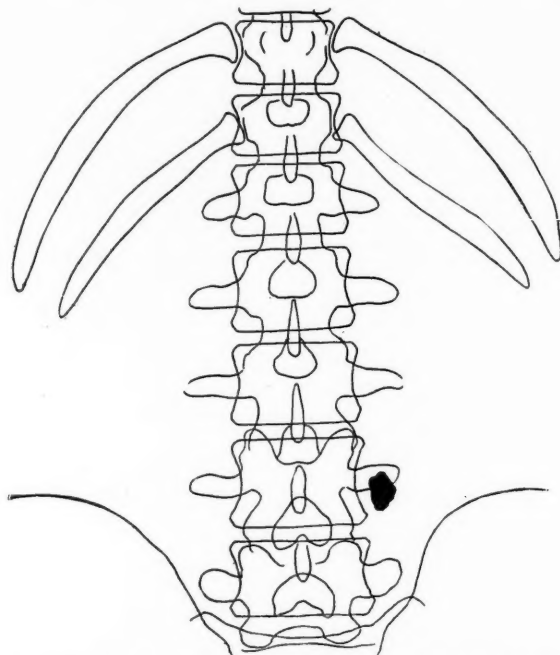


Fig. 7. X-Ray tracing of shadow in course of lumbar ureter due to calcified retroperitoneal gland. (Case 708).

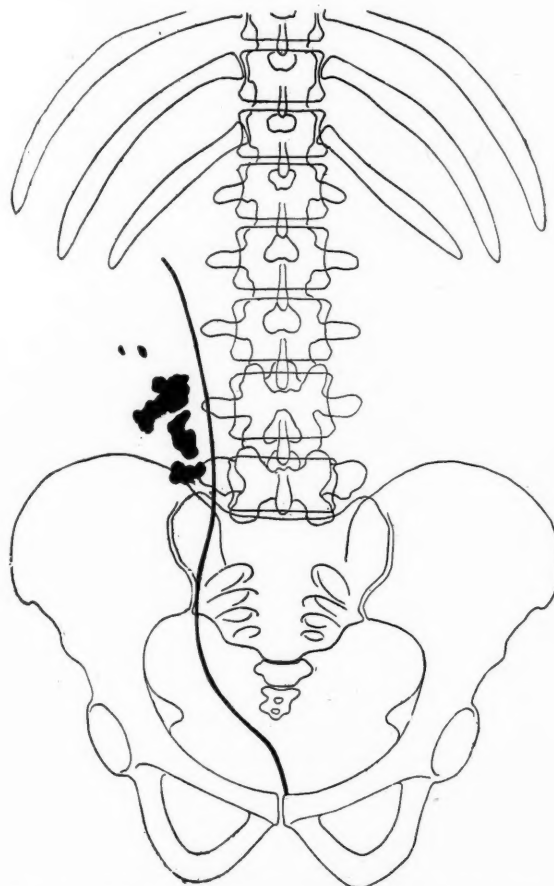


Fig. 8. X-Ray tracing of shadows probably due to calcified retroperitoneal or mesenteric glands shown to be extraureteral by use of shadowgraph catheter. (Case 1163).



that calculi lie either in much dilated calyces, i. e., a hydronephrosis, or that the parenchyma is replaced by a number of abscess cavities containing calculi, i. e., a calculous pyonephrosis. In this and the preceding class of cases one should never attempt a removal of the calculi

to do the work of both kidneys, should the operator deem it inadvisable to save the kidney containing the calculi.

#### BILATERAL CALCULI. (FIG. 10.)

I have called attention above to the fact that

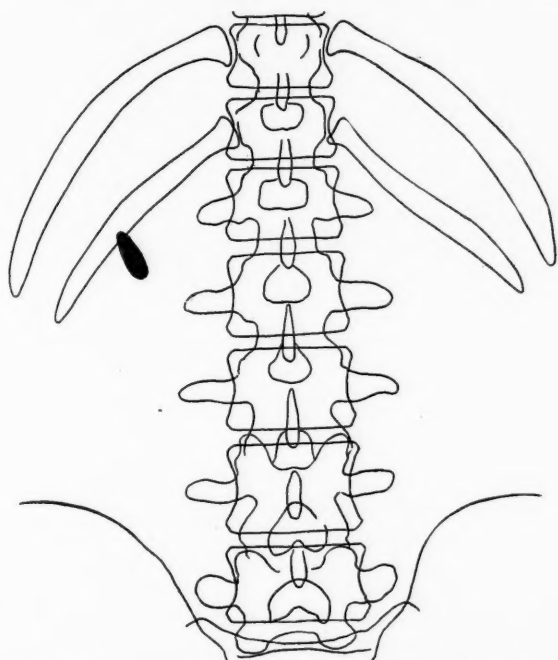


Fig. 9. Location of calculus at ureters pelvic junction. These are easily removed through an incision in posterior aspect of renal pelvis.

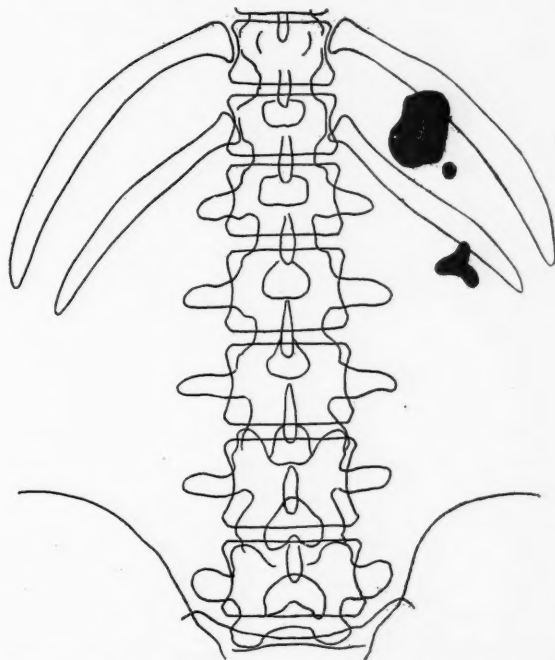


Fig. 11. Typical wide distribution of multiple calculus shadows in hydronephrotic or pyonephrotic cavities.

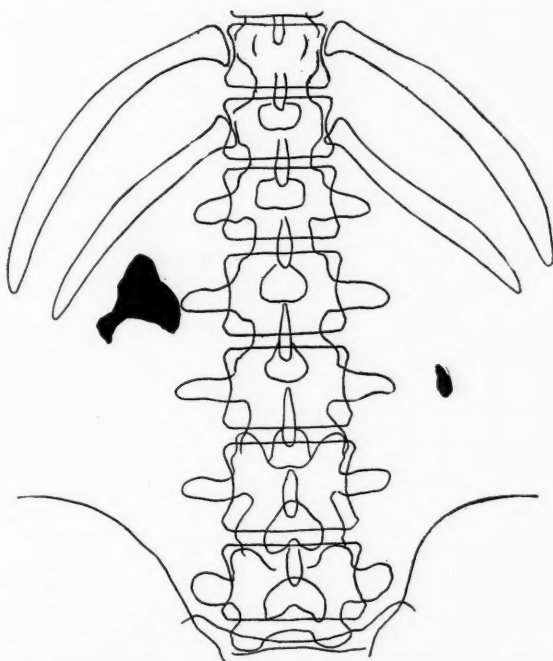


Fig. 10. X-Ray tracing of bilateral Renal Calculi (case 902).

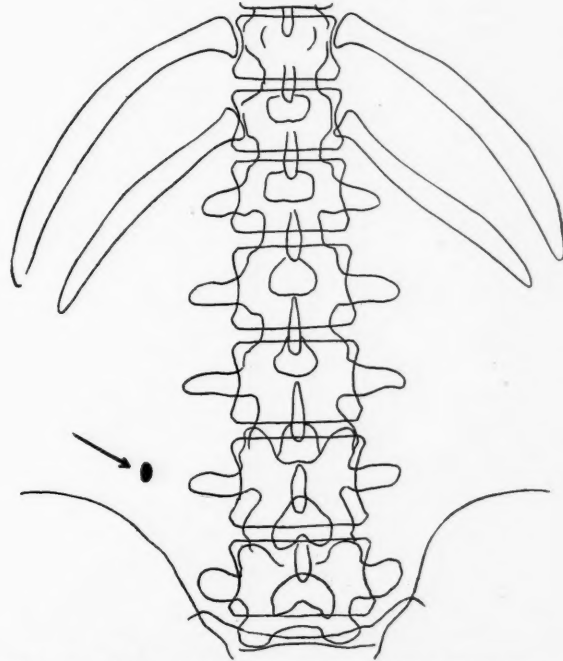


Fig. 12. X-Ray tracing of calculus in lumbar ureter. Numerous colics without change in position of shadows. (Case 540).

without having catheterized the opposite kidney and made various tests in order to determine whether an opposite kidney is present in an undeveloped form (congenital hypoplasia), and whether the opposite kidney would be able

no X-Ray examination can be considered as complete unless both kidneys and both ureters have been included. When we recall that bilateral calculi occur in over twenty per cent. of all cases, one need not emphasize this again.

The various combinations are: (a) Calculi in both kidneys; (b) same and both ureters; (c) same and one ureter; (d) calculi in kidney and ureter of same side and ureter of opposite side; (e) calculi in both ureters. I have observed such cases quite frequently. I must not

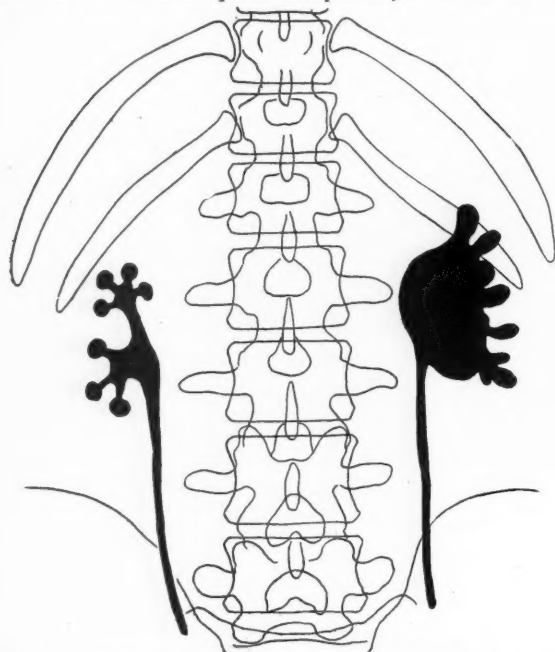


Fig. 13. Normal renal pelvis on right side and hydronephrotic pelvis on left side. Both filled with 10 per cent. collargol.

omit to mention that calculi may be present anywhere in the urinary tract and yet any of the extrarenal or extraureteral shadows enumerated at the beginning of this article be present at the same time. The greater our experience in this field the more careful do we become in the interpretation of plates.

#### URETERAL CALCULI.

We divide the ureter into four parts, the lumbar, iliac, pelvic and the portion lying within the wall of the bladder, the intraparietal. Nearly 80 per cent. occur in the pelvic portion, i. e., from the brim of the true pelvis to the bladder. In the majority of cases the history of colics, anuria or infection is of aid in interpreting the shadow, but there are many cases in which shadows are seen in which there have been no symptoms or where these have been altogether on the opposite side. Uric acid calculi will often fail to show a shadow even though the history of their passage is quite clear. If a shadow is seen in the line of the ureter (Fig. 12) the interpretation of the radiograph usually presents no difficulty to the experienced eye. If, however, the shadow is away from the course of the ureter, or there is the least doubt as to whether it is due to a calculus, it is best to take some additional pictures at different angles, either with or without having introduced the shadow-graph catheter into the corresponding ureter.

I must again remind you that a true calculus shadow may be present in the kidney and an extraureteral shadow below it. In one of my cases (Figure 6) the lower shadow proved to be a calcareous nodule of the ovary coexistent with a calculus lying in the pelvis of the kidney of the same side. I cannot urge too strongly to have every case radiographed in which the

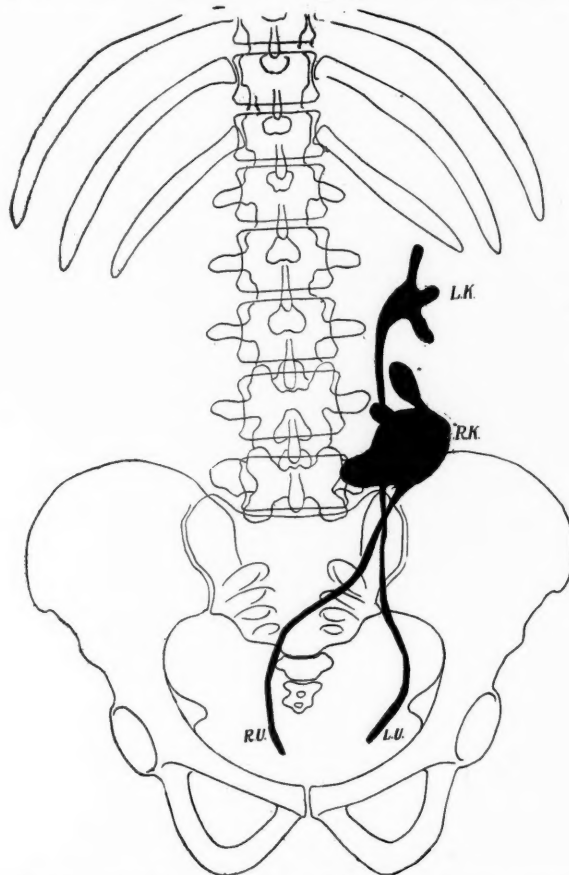


Fig. 14. Two kidneys on one side. Pelvis and Ureter filled with Collargol before taking radiograph. L. K. Left kidney showing normal renal pelvis. R. K. Right kidney showing hydronephrotic pelvis. L. U. Left Ureter. R. U. Right Ureter.

diagnosis of appendicitis, acute or chronic has been made, but not sufficient evidence found at operation to justify such a diagnosis. Many of these are cases where a ureteral calculus has been overlooked.

#### PYELOGRAPHY.

A glance at Figures 13 and 14 will show how the injection of collargol into the renal pelvis has been of aid in the differential diagnosis of renal from other abdominal tumors, or hydro and pyonephrosis, of tumors and tuberculosis of the kidney, of strictures of the ureter, of horseshoe and solitary kidney, of kidney from gallstones, and of recognizing the location of abnormally placed kidneys.

The normal renal pelvis will hold 4 c.c. of fluid. A hydronephrotic pelvis will hold up to 150 c.c. (Fig. 13).

## TOXEMIA OF EARLY PREGNANCY.\*

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GRAND RAPIDS, MICH.

Three deaths about two years ago from the toxemia of early pregnancy coming under my observation within a few months of each other have led me to report them, with the idea of perhaps helping to avert similar unfortunate outcomes in these not very infrequent cases.

CASE 1. The first case was that of a woman thirty years of age, who had been married four years, with one previous pregnancy ending in an early abortion without known cause. Possibly the fact that she was more than usually desirous of having children led Dr. J. B. Whinery and myself to a more conservative handling of her case than otherwise might have been ventured. Certainly in the light of my own experience since then and the knowledge obtained by recent investigation, it was unwise.

She menstruated for the last time in May, missed in June and soon afterwards became nauseated. The nausea persisting, she was put to bed and careful feeding instituted, with such light drug treatment as seemed indicated. At no time was vomiting extreme, but from the start the amount of nourishment she took and retained was decidedly less than the normal amount. Everything that careful nursing and suggestion could do for her was apparently carried out. From time to time there was betterment in her condition and on August 1st, when I first took charge of the case, the outlook for her recovery was encouraging, although she still vomited from three to four times a day. There was a moderate loss of color and some, though not marked, loss of flesh. There was considerable gas in the intestines, with at times moderate distention. There had been at times a slight trace of albumin in the urine and now and then a few casts, but even these disappeared later on.

After the first of August we were able to increase the nourishment somewhat but never to anything like the normal amount. She was able at this time to sit up a little each day and the pulse remained about 80, temperature normal. The pelvic examination revealed nothing abnormal. Her general condition remained on the whole about the same, with perhaps a slight loss of flesh and color. There was no jaundice. The mental condition was satisfactory, with the exception of some periods of despondency, which might have been accounted for by the fact that she was fearful her pregnancy might have to be terminated.

The vomiting several times suddenly increased without any apparent reason and at a time when she seemed to be improving. These storms of increased vomiting without apparent cause were common to all the three cases here reported. After one of these storms we became rather alarmed and on August 20th the uterus was evacuated under nitrous-oxide-oxygen. This was carried out with little loss of blood and apparently without causing any markedly increased weakness. The pulse was accelerated immediately following operation but subsided to about 80 four days afterward. In the decidua tissue removed were old hemorrhagic areas, a further evidence of a slight bleeding from the uterus noted at times during her illness.

She vomited several times the day of operation but none the next day, and took a considerably increased amount of nourishment. In the afternoon

of the second day she was slightly delirious for a period of about ten minutes in the afternoon. This was not repeated until the next day, when it recurred. Some vomiting again returned but from then until the end it was not marked, and she was able to retain a fair, though by no means large, amount of nourishment. Rectal feeding which had been resorted to during her illness was resumed. As stated, her pulse was about 80 four days after operation and then gradually rose until her death two weeks following operation.

The urinary findings following operation were negative with the exception of a very small amount of albumin and a few casts. It was normal in quantity and of normal specific gravity. About the time of operation some loss of vision in the left eye was noted but examination of the eye grounds was unsatisfactory. The estimation of the ammonia co-efficient was attempted at various times during her illness but for technical reasons was rather unsatisfactory, our experience with this procedure having been small. A discussion of the urinary examination I will take up later.

During the last two days of her illness she was delirious most of the time and restless. There were no convulsions. The red count ranged between two and a half, and three million; leucocytes four to eight thousand, with no disturbance in the differential count; hemaglobin 40 to 50 per cent.

The rather marked anemia in this case is interesting in view of the recent theory that pathological changes in the spleen produced by the toxic agent may be a factor in the production of extreme degrees of anemia during and following pregnancy.

There was no autopsy in this case.

CASE 2. Mrs. C., a woman thirty years of age. One child four or five years ago. She had considerable vomiting at this time and an emptying of the uterus had been undertaken. Just what was done is uncertain, but it did not end the pregnancy. The vomiting diminished after this and she went on to full term, with delivery of a normal child.

She flowed for the last time about October, 1911. Vomiting began soon after this and has persisted since. She had tried various drugs, had been on a very limited diet, and had lost considerable strength and flesh. About 48 hours before I saw her an attempt had been made to empty the uterus under chloroform but, although there has been some bleeding, pregnancy had apparently not been terminated. Vomiting had continued, there had been some flowing, and the abdomen was quite tender. In this case also there had been marked distention at times during the pregnancy. The pulse at the time I saw her was 130 and weak. There was no temperature. The mental condition was clear, although she was rather restless and anxious. She had had a very small amount of albumin and a few scattered casts.

On December 11th (the morning after I saw her), and when three months pregnant, the uterus was evacuated under nitrous-oxide without incident. She was under the anaesthetic about twenty minutes. At the time this case was first seen the prognosis was extremely grave. Here plainly, as in our first case, had occurred symptoms and conditions which called for a much earlier termination of the pregnancy. Vomiting ceased after 24 hours but the pulse gradually rose and she died four days after operation. The use of chloroform in the first attempted evacuation of the uterus is also, in the light of our present day ideas, open to criticism.

CASE 3. A patient thirty-six years of age, married seven years. One child two years, nine months old. No trouble with vomiting during this pregnancy. Patient had always been exceptionally well, strong, robust and energetic. Before this pregnancy she had been suffering from a slight nervous

\*Read before the Section on Gyn. & Obst. at the Flint meeting of the Mich. State Med. Society, Sept. 1913.



exhaustion, due to overwork, but had otherwise been well.

Her last menstruation came in the latter part of November, 1911. There was no particular nausea during the first month, but about January first she began vomiting and continued for eight weeks. At this time she was taken to the hospital, with the idea of evacuating the uterus, but she became somewhat better under hospital care, and this was deferred. During all these eight weeks previous to entering the hospital she retained almost no food; and although, as stated, she was somewhat better after entering the hospital, the improvement did not continue long, and a very low diet was again made necessary by the continuation of the vomiting. She had lost about twenty-five pounds in weight.

About the fifteenth of March she developed some mental symptoms, becoming apathetic and answering questions slowly and with difficulty, although she was not actually delirious at this time. Small amount of blood appeared in the vomitus at times and for weeks before she was first seen (the latter part of March) there had been at times some jaundice. The abdomen was more or less distended and the stools were offensive. An ordinary examination of the urine made at different times during this period revealed nothing abnormal. When seen she was rather pale, and had evidently lost some flesh but was by no means extremely emaciated. The tissues were soft and the mental condition was apathetic, as above stated; the abdomen was a little distended with gas; the uterus about four months pregnant; otherwise the pelvic condition was normal. The prognosis was very grave. However, on March 26th, 1912 (the day after I first saw her), the uterus was evacuated under nitrous-oxide-oxygen without untoward incident. Following the operation she seemed better and again took a little nourishment. This was pushed as rapidly as possible, with rectal feeding, but on the third or fourth day there was more vomiting and the diet was again necessarily curtailed. On account of her mental condition, which was becoming gradually worse, the stomach was washed frequently and followed by nourishment given through the stomach tube. The abdomen remained fairly flat, although at times somewhat distended. Under this treatment the vomiting was at no time following the operation excessive but other conditions did not improve. She became more apathetic, sleep was broken and obtained with difficulty. The pulse remained in the neighborhood of 100 until just before death, when it gradually rose. In this case, as in the first, sugar in solution was tried, with the hope that we might thereby increase the nourishment.

The mental disturbance of this woman for a week previous to death was marked. She was delirious making it difficult, as above stated, to feed her except through the stomach tube. She was at times very much excited; at other times lying almost in a coma. There were occasional periods, as in the first case, when her mental condition was fairly clear. Nystagmus was present. Two days before death small hemorrhages were found in the retina of the left eye a short distance above the disc on examination with the ophthalmoscope. There were at times slight flecks of blood in the vomitus.

In this case a post-mortem was obtained. There was marked fatty degeneration of the liver, about four-fifths of the organ being involved, but the liver was apparently normal in size. The edges were much sharper than usual, indicating some atrophy (liver exhibited). The section shows microscopically decided fatty degeneration of about two-thirds of the cross section. Here and there in the remaining third are areas of fatty degeneration, giving it a rather mottled appearance. The reddened areas de-

note a chronic passive congestion (nutmeg liver). Sections under the microscope show fatty degeneration limited to a great extent to the center of the lobule. Necrotic areas are present throughout. The heart was slightly atrophied, the myocardium fragile and showing degeneration changes. There was an old healed endocarditis of the mitral and aortic valves. The kidneys were apparently normal in size; capsule stripped easily. On section the kidney presented a mottled appearance caused by fatty degeneration—otherwise negative. The spleen was large and on section, the splenic pulp could be scraped off; or, in other words, acute splenic tumor. The gastric mucosa presented a few punctuate hemorrhagic areas, with slight congestion. The mucosa of the small intestines presented a few minute hemorrhagic areas, with slight congestion. Large intestine negative. Pancreas showed slight atrophy. The lungs, pleura and uterus presented nothing abnormal.

There is perhaps no phase of obstetrics which has excited more interest during the last ten years than that of the toxemia of pregnancy, as would be indicated from the great amount of literature which has been presented to us. Many of the symptoms or phenomena occurring during the pregnancy, and formerly considered as manifestations of a physiological condition, are now known to be the result of a toxemia peculiar to the pregnant woman. The nature of this toxemia and its origin still remains a matter of uncertainty, although a multitude of theoretical explanations have been advanced. Most agree that the toxemia in early pregnancy and that occurring later on are in all probability identical and vary only in time, degree and manner of appearance. Whether the symptoms be mild or severe depends upon the severity of the toxemia and the pathological changes resulting from it. The same toxin which causes pernicious vomiting and later eclampsia may produce but milder symptoms in the form of headaches, mild vomiting, changes in mental condition, stomach and bowel conditions, and the so-called neuralgias and diffuse pains of pregnancy.

Since we are still uncertain as to the exact nature of this toxin and its production, and of the pathological changes occurring in milder cases, any classification that we may make of the vomiting of early pregnancy is more or less arbitrary. It is common to distinguish two or perhaps three forms—a so-called nervous vomiting, a so-called reflex vomiting, and that due to a distinct toxemia. With further study we are led to believe that the division into two classes is better, since the so-called reflex vomiting is supposed to be the consequence of pathological changes present in the pelvis, but has not stood the test of strict investigation. These patients we may properly today place in the neurotic class. The good results sometimes obtained from the correction of pelvic conditions is very likely due to suggestion. We do know that these patients of the so-called neurotic type

are peculiarly susceptible to suggestive therapy, betterment often following well directed efforts along this line. We cannot gainsay, however, that these so-called nervous cases are not fundamental of toxic origin, and it is the view of Williams, Ewing and others that a mild toxemia operating in a patient peculiarly disposed nervously may produce symptoms strongly simulating the plainly toxic form.

It is extremely necessary to differentiate between these two forms, and yet the diagnosis is often not easy. The problem becomes more complicated when we remember that the question of starvation enters often into consideration. This latter factor in a neurotic case may so accentuate the severity of the symptoms as to itself produce death. As a matter of fact, however, patients of this class as a rule respond rapidly when the diet can be largely increased, whereas in the toxic type no such good results follow. In the early stages the two forms would seem very hard to distinguish. Later on (and unfortunately often when it is too late) the difference becomes more apparent. In the toxic type mental symptoms appear, jaundice, vomiting of small quantities of blood, and often considerable anemia. In the nervous type no such manifestations occur.

It has been my experience that the early symptoms of signs of exhaustion, shown by extreme nervousness, excitability and a marked increase in pulse rate, belong to the nervous type, whereas the toxic variety will have a more insidious course. The pulse remains practically normal, the physical examination, beyond some loss of weight and tone, and a mild palor, give but negative findings. It is to be emphasized that the urine to all ordinary examination, remains satisfactory, a trace or a small amount of albumin and a few casts being about the extent that we may expect, and even that not present in the majority of cases. I would not, however, wish to place too much emphasis upon such a differentiation as I have mentioned.

This brings us to the question of the ammonia co-efficient. Nitrogen is excreted in the urine normally in the form of urea nitrogen forming about 87 per cent. of the total; in the form of ammonia nitrogen in about 4 per cent. of the total, purin bodies in the form of leucin and tyrosin (purin body nitrogen) 3 per cent., and so-called "rest" nitrogen about 6 per cent. This includes the amino acids often mentioned. The ammonia nitrogen is of peculiar interest and importance because of its marked increase under certain conditions. With it take place a diminution of the urea and increase in the rest nitrogen. In the toxemia of early pregnancy, and as has been shown in patients who are on an extremely low diet, a marked increase of ammonia per cent takes place, going from the normal 4

per cent. to 15, 20, 30 and even 40 per cent. It is because of the discussion that has taken place over the value of this ammonia co-efficient, the doubts that have been expressed as to its significance, and the fact that the laboratory estimation is tedious and difficult, that it is safe to say it has not been used except in well equipped laboratories and by men particularly interested in this problem. Such has been until recently my own doubts in the matter that it was not employed in any of the three cases above mentioned. In the light of the present day knowledge I regret this, for it might have been of value to us. If the results as given today are substantiated by further experience, this will undoubtedly become a necessary laboratory examination. The fact remains, however, that the practitioner today does not employ it but is depending upon other clinical data. These urinary changes and the increase of the ammonia present are probably the result of pathological changes in the liver, with consequent changes in metabolism. The pathology of this condition is today well established. As a result of a toxin present in the blood of the pregnant woman there takes place well defined changes in various parenchymatous organs. The liver is the organ most severely affected. The case which I have presented with its post-mortem findings is typical.

As to therapeutics: Knowing the results that may follow from procrastination in cases of early toxemia, it goes without saying that every woman presenting anything but the very mildest form of vomiting should receive serious consideration and be under constant supervision. When a woman is vomiting to such an extent as to prevent her retaining sufficient nourishment, the question to be immediately settled is whether this vomiting is of toxic or neurotic origin. The patient should be put to bed in quiet surroundings, removed if possible from the family environment. All food per mouth may be temporarily withdrawn, and rectal nutrient enemata resorted to. The use of continued salines per rectum or of hypodermoclyses will be found valuable. This is a situation peculiarly adapted to intelligent therapeutic suggestion and must be met according to the mental state and disposition of the patient. Not infrequently she will have an aversion to her present pregnant state. This may sometimes be remedied by an attempt to change her views on the subject and presenting the dangers of abortion. We have all seen, I think, marked results from this course. Williams lays particular stress upon it and his results have been remarkable. If now, after a physical and the ordinary urinary examinations, we can obtain an estimate of the ammonia, such is we believe today desirable. The exhibition of sugar in the toxic cases is of very questionable value, although its use has

been suggested. If these measures have been thoroughly carried out and there is no improvement, the uterus should be emptied since it is only by its prompt evacuation that we may hope to check pathological changes in the liver and other organs, and prevent the disastrous results shown in the three cases that I have just cited.

It is to be noted that in the cases here reported, as well as in those cited by others, death occurred some little time after the uterus was emptied, even after temporary improvement, showing that irreparable damage had already occurred. Chloroform should never be used as an anaesthetic when an operation is undertaken. Attention was first called to this by Whipple and Sperry, and concurred in by Williams. The damage to the liver resulting from chloroform poisoning is identical to that from the toxemia of pregnancy, the findings common to both being a central necrosis of the liver lobules.

The following bibliography contains many of the best articles on this subject and has been reviewed in preparing this paper.

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# PUERPERAL ECLAMPSIA AS ENCOUNTERED BY THE COUNTRY PRACTITIONER.\*

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I suppose that puerperal eclampsia presents the same conditions wherever encountered. Whether they occur in the country or in the city, in the practice of the most ignorant midwife or in that of the ultra-accomplished obstetrician, all cases will present about the same problems for consideration.

Whatever element of difference there may be will probably be found in the immediate surrounding of the patients, or in the unfortunate individuals upon whom rests the responsibility for the care of these cases.

With these thoughts in mind, I take it for granted that this paper will be expected to reflect something of my personal experience with this disease and my ideas regarding it. In the past twenty-one years I recall sixteen cases of puerperal eclampsia which I have seen. I practiced nine years before I saw a case of this kind. Seven of these cases were my own, of which I have more or less complete records. Nine were seen in consultation, and of these I have no permanent records, and perhaps do not include all the cases which I have seen, but all that I can recall at this time.

As to the clinical history of my own cases, four were primiparae and three multiparae. Three of them were ante-partum cases, all primiparae. One was supposed to be at term—one between six and seven months pregnant, and in one a single convulsion came twenty-four hours before the beginning of a spontaneous labor. Three of the cases were intra-partum and one post-partum, convulsions coming one week—lacking a few hours—after delivery.

One case—classed as antepartum—presented some curious symptoms. A young primipara had a convulsion twenty-four hours after confinement. She had a breech presentation, a rather tedious labor with no symptoms of convulsions until twenty-four hours after delivery, when she had eight in one and one-half hours, going from one into another before she had ceased jerking from the preceding one.

We are often asked the question: "Why does a pregnant woman have convulsions?" I am sure I do not know any more about it than I did twenty-one years ago when I saw my first case; perhaps not as much as I thought I knew then. At that time, if I examined the urine every two to four weeks and found it free from albumin I considered my patient safe from convulsions. Since then I had a case which developed convulsions within ten days after I had ex-

\*Read before the Gratiot County Medical Society.



amined the urine and found it free from albumin, and another case in which the urine, drawn by catheter during the attack, showed only a bare trace of albumin, and twenty-four hours after none whatever. Again, I once believed that puerperal convulsions were caused by the so-called uremic condition, plus some nervous factor. In all the cases of nephritis, both acute and chronic, which I have seen outside of pregnancy, I can only recall two or three cases which had convulsions.

As to the nervous influence, I had a rather strange experience in my first case. The woman was an elderly primipara, and the urine had shown some albumin for several weeks. Confinement was expected at any time, but the urine became so unsatisfactory that I thought I ought not to delay delivery any longer and called to tell her so. Until this time she had felt perfectly well. She at first objected to the proposed treatment, and before I had completed my argument she became very restless and complained of a pain in her head. I thought she was upset by our line of talk, and did not take it very seriously at first, but she had convulsions three or four hours afterwards.

Whatever significance albumin may have in the urine in these cases, I do not think I have ever had a case which did not at sometime show at least a trace of albumin. Curiously enough, I find on my records an equal number of cases which showed albumin in the urine but did not develop convulsions. One of these women had albuminuria in both her pregnancies—she has been pregnant only twice.

It is generally believed that the direct cause of puerperal eclampsia is a toxin developed by metabolism within the body of the woman, or her fetus, or both. We will all agree, I think, that the fetus must have something to do in producing this poison for the reason already stated—that a woman with similar clinical symptoms minus the fetus would not be expected to develop eclampsia. We would suppose that metabolism should be essentially the same in all pregnant women, and if so is this toxin the result of a perverted process, or is it an accumulation by over production or retention of what is normally produced in every pregnant woman by her fetus? I do not think that the question has ever been solved, but I believe it will be some time. I am at present believing that the nitrogen products of metabolism in some way stand in close relation to this poison.

I believe that the change in the kidneys is due to the irritating effect on their structure of this poison and whatever part they may take in any case results from the impairment or suppression of their function.

I have thought that over eating, especially of nitrogenous foods, had a great deal to do with some cases perhaps by adding to the work of

the already overburdened kidneys. I believe that a great many pregnant women eat too much and take too little exercise.

A young woman between six and seven months pregnant, who had shown some albumin in the urine, ate freely of ice cream and cake at a party one evening, and developed convulsions the next morning. In another case, the urine was examined about three weeks before delivery by a physician in another part of the state, and pronounced all right. The young woman came to her parents' home shortly before Christmas. The second day of January she was confined and had convulsions and showed albumin in the urine afterwards. Perhaps the Christmas and New Years dinners had nothing to do with the attack, but I at least thought of the coincidence.

Against the fetal theory along comes a woman separated from her fetus a week before and still has convulsions.

The fact that the urine shows only a little or possibly no albumin at all does not prove that the kidneys are sufficient. They might be perfectly healthy and still be insufficient. Albumin in the urine only shows that the kidneys are damaged and then they sometimes seem to be sufficient for elimination, at least all pregnant women with albumin in the urine do not have convulsions.

I do not suppose that anyone believes in any hereditary or family tendency to this trouble, yet I saw two sisters die from puerperal eclampsia within eight months of each other. One of them was my own patient and the other was seen in consultation.

All I know of the pathology of puerperal eclampsia has been learned from others. I have never seen an autopsy of one of these cases that I now recall.

As to the cause of death, in most cases that I have seen it seemed to me that death was due to the effect of poison on the nerve centers. I do not believe that the convulsions kill; I do not know why they should any more than convulsions should kill an infant, which they rarely do; or epileptic convulsions kill, which they probably never do unless by accident.

Regarding the symptoms of puerperal eclampsia, there is only one I care to speak of and that is a premonitory symptom. I refer to the neuralgic-like pains often complained of by women who are liable to convulsions.

A few years ago I was called out of bed to relieve a young woman of pain resembling a severe case of intercostal neuralgia. Blindness shortly followed this pain, and convulsions within six hours. This, with other cases I have seen, leads me to say that if you have a pain of this character in a woman who is a possible subject to convulsions—no matter whether it

is in her head or elsewhere—you should be on your guard.

The prognosis of puerperal eclampsia is of course grave. Two of my seven cases died, both primiparae, and both antepartum cases. One did not die from the eclampsia, but from septic peritonitis eight days after forced delivery. In nine cases seen in consultation I think there were four deaths. Three were primiparae and one multipara. Only one death was an antepartum case. Two were postpartum, and in the fourth I think the convulsions came on during labor.

In view of the extremely serious nature of puerperal eclampsia, I believe that prophylaxis should be instituted in every pregnant woman, no matter how satisfactory her condition may be, especially in the latter half of pregnancy. Elimination should receive attention. The bowels and skin should be kept active. The surface should be protected by woollens to guard against sudden chilling and suppression of the functions of the skin. The urine should be frequently examined not only to find if albumin is there, but to get some idea of the amount of solids excreted by getting the specific gravity and quantity.

Attention to the diet is a most important thing. As I have stated before, I believe that many women in the latter months of pregnancy eat too much and take too little exercise. Some of them may think it necessary for them to eat a great deal to give them strength to effect delivery properly.

Assuming that the cause of puerperal eclampsia may be in some way related to the nitrogen compounds, the protein intake should be limited, being mindful of course that the mother must provide for the growing muscles of the fetus. I believe that we should insist on a pregnant woman taking plenty of exercise of a suitable kind. It is better that the food should go to build up her muscles than that its half burned products go to still further increase the burden on the kidneys.

When albumin in the urine shows that the kidneys are becoming more or less damaged, increased activities in the way of prophylaxis are of course indicated. I cannot say, however, that it has seemed to accomplish very much in my hands. In spite of the milk and vegetable diet, the hot baths and doses of salts, the albumin has staid there, and in two cases the women had convulsions and with only little previous warning.

I am becoming more and more convinced that in some cases a prompt termination of pregnancy is the proper treatment, especially if the case is a primipara and the albumin appears suddenly and early in the last half of pregnancy.

When convulsions occur, the proper course

of treatment, and the one I think every doctor would agree to, would be to remove the cause and hasten elimination of the poison accumulated in the woman's body. As pregnancy is primarily responsible for all that follows, separating the woman from her fetus should, theoretically at least, stop the cause. That is, stop the production of the poison.

To remove the fetus quickly before labor is advanced demands a forcible dilation of the cervix, or a hysterotomy either vaginal or abdominal. Forcible dilation, instrumental and manual, until the os would admit of extraction, is the only method of speedy delivery that I have had any experience with. This method has sometimes done very well, but has not always been satisfactory. In case of a primipara with a long thick cervix it may take several hours of the most fatiguing work to dilate sufficiently to do a version, apply the forceps, or even do a craniotomy. I question very much whether a feverish haste to deliver in this class of cases by this method is proper treatment. The pulling and hauling at the cervix, the almost innumerable times that the fingers or hand will be introduced into the vagina on account of the fatigue and necessity of changing hands, with either the Edgar or Harris methods, and finally pulling the fetus out through a half dilated cervix, certainly exposes the woman's life to grave dangers from infection and injury.

If a hysterotomy is not expedient I believe it would be better to dilate the cervix moderately with a steel dilator under aseptic precautions, pack the cervix and perhaps the lower uterine segment with antiseptic gauze, and wait some time before trying to deliver. The length of time, of course, depending upon the further developments in the case.

This may seem like playing with chance, yet delivery does not always stop the convulsions, not suddenly at least. In the sixteen cases I have seen convulsions recurred or came on after delivery in all except three, and as I recall these, two of them had single convulsions only, and the third not more than two or three.

In the sixteen cases we are considering, manual dilation and extraction was done in six cases, five primiparae and one multipara. Three of these women survived; three died, and all the babies succumbed. However, three of them were probably too young to have lived under the best conditions. One of the women who lived was a multipara, and dilation in this case was easy and rapid.

I believe that prompt eliminative treatment is of great importance. The bowels should be unloaded by a dose of croton oil if the patient cannot swallow, and perspiration induced by wrapping the body in blankets wrung out of hot water.

In one of my recoveries, a very plethoric woman, I bled a pint. Four of my own cases and one seen in consultation got one or more quarts of physiological salt solution subcutaneously. One of these cases died. I have usually given remedies to reduce the blood pressure, veratrum viride or nitroglycerin, but there is a question in my mind whether the increased blood pressure is not an effort of nature to aid elimination, and this leads me to say that if we were to take the blood pressure in some of these cases in the latter months of pregnancy, we might learn more of their condition before dangerous symptoms developed. To control the convulsions, chloroform, morphine and chloral can be given.

As I have already stated I do not believe that the convulsions kill. I think that the number and continuance of them shows in a measure the extent of poisoning. I question very much whether the free use of these drugs should be employed. Of course the fits appear to the friends as the most terrible and dangerous feature of the disease, so a reasonable effort to control them should perhaps be made, remembering that the long continued use of chloroform is not without danger, and that the effect of morphine and chloral on the already almost paralyzed nerve centers should be carefully watched. Many cases will go from bad to worse in spite of all treatment, and I think that there is a better tendency at present to belittle all forms of treatment that do not have for their object the emptying of the uterus.

I have in mind a case in which convulsions came on twenty-four hours after delivery, when the patient had a perfect storm of them. Croton oil was given when she could yet swallow, and while the oil was in transit she was given a quart of saline solution subcutaneously, which she took no notice of whatever, she seemed so profoundly unconscious. Soon after she suddenly roused up, jumped out of bed, grabbed a chamber and got busy with the oil, fighting like a wild cat to keep off the attendants who thought it their duty to drag her back to bed. She was up several times in the next few hours, and had no more convulsions. My records show that in the next twenty-four hours she passed 128 ounces of urine. Of course how much the croton oil and salt solution had to do with her recovery is hard to say.

Cases respond so differently to treatment, or perhaps I had better say they respond so indifferently to treatment, that it is pretty uncertain as to the value of any particular line of treatment. Probably we all do about everything we can think of when we get a case of this kind.

To conclude briefly, I will say that I do not believe the cause of puerperal eclampsia is much better understood than it was forty years

ago. No doubt the effects of this mysterious cause, whatever it may be, have been more closely observed. What it does to the liver, brain and kidneys is better known, but that is about all. I think the most noteworthy change in ideas has been in regard to treatment. I believe that obstetrical interference is more generally recommended, that is, measures to empty the uterus promptly. Some recommended this procedure a good many years ago, but I think the majority were against it, and some were very strongly opposed to it.

### A CONSIDERATION OF SOME PHYSICAL SIGNS IN PULMONARY TUBERCULOSIS.

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In examining a chest it is advisable to have certain definite landmarks fixed in one's mind. We usually locate the boundaries of the patient's right lung anteriorly while he is lying down, posteriorly while he is sitting or standing. The lower boundary, in the para-sternal and mid-clavicular lines, is at the upper edge of the sixth rib, in the axillary line at the eighth to ninth rib, in the scapular line at the tenth rib, in the posterior-median line at the eleventh vertebral spine. The border, therefore, is nearly horizontal. The lower border of the left lung is practically at the same level. Vigorous respiration elevates and depresses the lower border of the lungs several centimeters.

The mobility of the lower lung border is diminished in: I. Pulmonary emphysema; II. Partial consolidation of the lungs; III. Many cases of incipient disease at an apex without any pleuritic adhesions whatever, because a diseased lung in an attempt of nature to keep it quiet does not expand well; and IV. Pleuritic adhesions between the pulmonary and costal pleurae.

The best method for demonstrating the mobility of the lower pulmonary border is to fix, by percussion, the lower boundary while the patient holds his breath at the end of a deep inspiration, mark it on the chest wall and then do the same during forced expiration.

In order to diagnose a free pleura a mobility of at least five centimeters should be found. This should be apparent promptly; otherwise the findings may not be trustworthy, for an adherent pleura may be drawn down during a deep inspiration by adhesions to the diaphragm.

Ordinarily, in quiet breathing and a recumbent posture, the upper border of liver dullness coincides with the lower border of pulmonary resonance and is found at the upper edge of the sixth rib. In the median line the liver dull-



ness lies half way between the liver and the tip of the ensiform cartilage. In the right mamillary line it reaches the edges of the ribs or projects slightly below them.

The bifurcation of the trachea and the division between the upper and lower lobes of the lungs takes place opposite the third dorsal spine or the lower edge of the fourth dorsal vertebra, and Schroeder's field, in which enlarged bronchial glands may sometimes be detected by means of percussion, is a small area of dullness about two or three inches in length along the spine on the left side opposite the bifurcation or a little lower down.

The most prominent spine at the back of the neck is that of the seventh cervical vertebra. Its prominence when the head is bent forwards makes it usually easy to find. Where three vertebral spines are quite prominent in this region, the seventh is usually the middle one. The first lumbar spine can usually be recognized from its being broader than the dorsal spines. Where the seventh cervical spine cannot be positively located in this way, the vertebrae should be counted from the first lumbar upwards.

Only two-thirds of the spleen is percussible, the upper third being covered by lung. In determining splenic dullness one should percuss downwards in the posterior axillary line until dullness is reached, then parallel to the ribs until a good clear tympanitic note is obtained. Normally the splenic dullness is seven centimeters long and five centimeters from the free border of the ribs.

Under the edge of the ribs on the left side is a space bounded above by the lung, below by the free costal margin, on the right by the left lobe of the liver and on the left by the spleen, called Traube's space. This is of considerable importance in the diagnosis of left-sided pleuritic exudates which often entirely obliterate this space. Such a dullness is easily demonstrated and when present is indicative of a left sided pleural effusion. It must be remembered, however, that owing to pleural adhesions left sided exudates do not always encroach upon Traube's space. The fuller the pleural cavity becomes the lower down the fluid reaches, and the more Traube's space tends to become obliterated. The absence of Traube's space is a more valuable sign of effusion than the presence of Grocco's triangle.

Breathing is bronchial only when expiration is louder than inspiration. All others are modified vesicular. The expiration must be louder *more accentuated*. It may also be longer, but the feature of *loudness* of the expiration is the differentiating element. Broncho-vesicular breathing is that in which expiration and inspiration are the same. Bronchial breathing may be loud or otherwise, very distinctly or

very faintly heard, but in order to call breathing bronchial, the expiration must be *louder* than the inspiration.

When you find dullness on light but not on heavy percussion, it shows a thickened pleura, as heavy percussion brings out the tone of the underlying lung.

The percussion note over the back of the thorax may be unlike on both sides because of better development of the muscles on one side than on the other. The posture of the patient in bed may also make a good deal of difference in percussion. Prove your suspicions by auscultation. Of much greater importance is the presence of rales on one side.

#### PULMONARY RALES.

All rales originate in the bronchi. If the bronchi are surrounded by solid lung and the alveoli are filled with fluid, they are consonating or resonant rales. If surrounded by air they are non-consonating or non-resonant rales. Consonating rales at the apex of the lung are pathognomonic of tuberculosis. If there are but few, they are heard at the end of inspiration. If there are more, they are heard during the entire inspiration. If there are many, they may be heard during both inspiration and expiration. These consonating rales originate in bronchi surrounded by consolidated lung. They may be fine, medium or coarse, but they are always loud. They are high-pitched and are heard close to the ear. Crepitation in atelectasis is heard during both inspiration and expiration, while in pneumonia it is heard only in inspiration. Otherwise the rales are the same, excepting perhaps being a little coarser in atelectasis.

There are three conditions in which fine, moist, non-resonant rales may be heard above the clavicle: I. Incipient tuberculosis: II. In the later stages of an acute bronchitis—the rales in the lower portion of the chest may clear up first and fine rales be found at the apex only for quite a while; III. In influenza. There are cases of influenza which last for months or years with influenza bacilli in the sputum and which do not react to tuberculin in whatever form it may be administered.

You cannot get fine rales at an apex due to pleurisy. There is too little movement at the apex during inspiration to give a pleural rale, and whatever rale you find at an apex above the clavicle is produced in the lung. In fact many authorities believe that all fine or crepitant rales heard in cases of pleurisy are produced in the atelectatic lung under the inflamed pleura and are not due to movement between the pleural surfaces. In the deadhouse, the pleural surfaces at the apex are found adherent and immovable in chronic tuberculous cases.

## LOBE LANDMARKS.

While the right lung has three lobes and the left two clinically this difference does not exist. The division between the upper and lower lobes is at the same place in both lungs and begins at a point opposite the third dorsal spine. In the mid axillary line all three lobes are met with on the right side. There is a small part of the lower lobe in front on both sides, but practically the front of the chest is occupied by the upper lobe and the back of the thorax below the fourth dorsal vertebra by the lower lobe.

It is important to remember where the apex of the lower lobe in the back is situated. Osler states that in the upper lobe the primary lesion of tuberculosis is not as a rule at the extreme apex, but from an inch to an inch and a half below the summit of the lung and nearer to the posterior and external surfaces. The lesion here tends to spread downward, probably from inhalation, and this accounts for the circumstance that examination behind, in the supraspinous fossa, frequently gives indications of disease before any evidence exists at the apex in front. Anteriorly this initial focus corresponds to a point just below the center of the clavicle, and the direction of extension in front is along the anterior aspect of the upper lobe along a line running about an inch and a half from the inner ends of the first, second and third interspaces. A second less common site of the primary lesion in the apex "corresponds on the chest wall with the first and second interspaces below the outer third of the clavicle. The extension is downwards so that the outer part of the upper lobe is chiefly involved.

In the involvement of the lower lobe the primary infiltration is about an inch to an inch and a half below the apex, and corresponds on the chest wall to a spot opposite the fifth dorsal spine. This is of the greatest importance clinically, as "in the great majority of cases when the physical signs of disease of the apex of a lung are sufficiently definite to allow of the diagnosis of phthisis being made, the lower lobe is already affected." (Osler.) Examination therefore should be carefully made of the apex of the lower lobe in all suspicious cases. In the situation the lesion spreads downwards and laterally along the line of the interlobular septum, a line which is marked by the vertebral border of the scapula when the hand is placed on the opposite scapula and the elbow raised above the level of the shoulder. Once present in the apex, the disease usually extends in time to the opposite upper lobe; but not, as a rule, until the apex of the lower lobe on the same side has become affected.

Two per cent of all cases of pulmonary tuber-

culosis are in the lower lobe. Ninety-eight per cent are in the upper lobe. In ninety-five per cent. of the cases the disease appears *clinically* in the apex. Tuberculosis of the lower lobe has very different ear marks from an apical tuberculosis. When in the apex, the usual symptoms are present, such as fever, emaciation, etc. while in lower lobe tuberculosis many rales and a good deal of cough and expectoration may be present, but the general condition may be good. There is not so much emaciation. As in pneumonia, the prognosis in an apical or upper lobe case is worse than in pneumonia of the lower lobe, so is the prognosis in tuberculosis of an upper lobe worse than in that of a lower lobe. Tuberculosis of an upper lobe leads to death or healing. In the lower lobe it seldom kills, but almost never recovers. Such patients will always cough. This difference in prognosis may be accounted for by the difference in the lymphatic circulation in different parts of the lung. In tuberculosis of the upper lobes, gravitation assists the toxins in entering the circulation and systemic symptoms are usual. The entire organism is flooded with them and the spleen, liver and other protective glands of the organism are stimulated to the production of antibodies. If they are produced in sufficient quantities, the patient gets better. Otherwise, he dies.

In tuberculosis of the lower lobe, gravitation does not help toxins to enter the circulation and there is usually but little if any secondary toxemia.

When rales are found with the first one or two deep inspirations at an apex, or any where else, and then disappear, you know they may be due to atelectasis. If, however, they reappear again in a minute or two, and show a tendency to permanency, they are due to a catarrhal process and are very suspicious of tuberculosis. Dry or moist rales located at one spot as a rule generally mean tuberculosis, which may be evidenced for a long time by a dry catarrh at the apex.

## THE CARDIAC AREA.

The precordial edge of the left lung forms a notch within which the heart lies directly against the thoracic wall. This notch corresponds to the so-called area of superficial cardiac dullness which may be almost or entirely obliterated by a deep inspiration.

Although easier to determine than the relative or deep cardiac dullness the superficial dullness is not always of value in estimating the size of the heart or pericardium. A heart may be enlarged and yet the superficial dullness may not be necessarily increased because of the presence of emphysema or fixation of the edges of the lung in the neighborhood of the heart by pleuritic adhesions. The relative dullness of

the heart is thirteen centimeters in width and fourteen centimeters in length measuring from the highest point in the median line where the relative dullness begins to the apex. Relative dullness indicates the absolute size of the heart. It extends normally to the right edge of the sternum. If it extends beyond, it indicates enlargement of the right ventricle. The relative and absolute dullness at the left side should meet at the apex. The sternum often acts as a pleximeter and on percussion one cannot always tell just where the heart reaches in relation to it. It may come just underneath its left edge or may reach to the right border. If the heart reaches two thirds of the way under the sternum for instance, it will give a duller note throughout its entire width, so one should never try to mark a point on the sternum where the right border of the heart is supposed to reach. One can only say that dullness extends to one or the other edge of the sternum. Of course there may be a difference between the upper and lower end of the sternum on percussion which will assist in making a diagnosis.

During inspiration the pulmonary pressure is changed and in normal hearts one often finds a splitting or reduplication of the second sound at the apex because the pulmonary valves do not close synchronously with the aortic valves. It must not be forgotten that this reduplication is often present in mitral stenosis.

In a tuberculous process at an apex one frequently finds dullness at an early period of the disease, but when this goes on to healing, cicatricial tissue is formed and contraction of the apex takes place with compensatory emphysema about it, so that in a healed process at an apex one often finds a tympanitic note on percussion. A tympanitic or hyper-resonant note, therefore, may be due to either a cavity or emphysema about a healed process. When one finds a tympanitic note at an apex and wishes to differentiate between a cavity and scar tissue with emphysema one must examine Kroenig's isthmus. If this shows a sharply contracted space it speaks for an old healed process in the lung.

In any case of cough and impaired breathing we must differentiate between the shortness of breath that depends upon congenitally small hearts and arteries and that depending upon emphysematous changes in the lungs. In general enteroptosis we may find displacement of the lungs, heart and diaphragm, but enteroptosis of the heart alone may be present without any involvement of other organs. In these cases, the X-Ray shows a much larger space than usual between the heart and the left chest wall. The mediastinal shadow is narrow and the heart smaller. These patients are predisposed by their small hearts to tuberculosis. These cases of congenitally

small hearts often complain for years of shortness of breath and stomach trouble. The heart tones must be sought for lower down than normal. When percussion makes out a small heart in a case of tuberculosis, we cannot always say that the heart is really smaller than normal, for it may be simply turned forwards on its axis. The X-Ray here also is useful.

Rude respiration may be heard normally at the right apex. When heard there it is of but little value and can be used only as a basis for suspicion. It differs so little from the normal respiratory sounds heard on the right side that a diagnosis cannot be made from it alone. Grancher's rude respiration consists of a sharpened inspiration and a prolonged expiration of the bronchovesicular type which is sometimes heard normally on the right side. When heard over the left apex, however, it is a very suspicious sign of incipient tuberculosis.

#### THE SPUTUM.

A purely tuberculous process never gives rise to a foul smelling sputum. It is true that the sputum of tuberculous patients frequently has a very bad odor, but this is due to decomposition of secretions in cavities. Of course, after standing, sputum may acquire a bad odor from the action of bacteria. Freshly expectorated sputum may have a strongly offensive odor in bronchitis, bronchiectasis, pulmonary gangrene, pulmonary abscess, and in empyema which perforates into the lung. Sputum which separates into layers on standing is seen chiefly in chronics bronchiectasis, chronic bronchitis, putrid bronchitis and gangrene of the lung. In these conditions it is profuse and fluid and separates into three layers; an upper frothy layer, a middle fluid layer, consisting chiefly of purulent serum or mucoid fluid, and a third layer of sediment which consists of pus corpuscles, gangrenous shreds of lung tissue and molecular lung tissue.

#### VOCAL FREMITUS.

All clinicians are agreed that both vocal fremitus and vocal resonance as well as the percussion sounds are more marked on the right side than on the left. On the right side from the apex to about the level of the second interspace or the third rib, the percussion note is slightly higher in pitch, shorter in duration and less resonant. The actual amount of these variations is never great in degree, but is of extreme clinical importance on account of the frequency with which incipient tuberculosis manifests itself by physical signs at the right apex. If no allowance be made for the normal variation in the two sides of the chest, errors in diagnosis may easily occur.



## CAVITIES.

The question whether or not a lung contains a cavity is often of considerable importance especially from the stand-point of prognosis. Small cavities or fairly large ones which are sharply defined frequently give a favorable prognosis, while communicating cavities or single cavities, especially if recent and with active constitutional symptoms, give a bad prognosis. It has long been said that once formed a cavity can never be obliterated and Osler states that cavities of any size can never completely heal. In view of recent experiences in the treatment of pulmonary tuberculosis by artificial pneumothorax in which cavities have completely healed and been replaced by scar tissue, such statements will have to be somewhat modified in the future.

In any case, however, the prognosis should be guarded, owing to the possibility of a sudden and fatal hemorrhage.

Cavities are present in the great majority of chronic cases and it has been stated that every case develops some evidences of excavation, howsoever small. Of seventy-eight cases which Flint analyzed, sixty-two showed cavities. Of fifty-three cases examined at the Phipps Institute fifty had well-marked cavities. As they are the final stage in the tuberculous process they are usually found where the disease first appeared, and in fifty cases examined at the Phipps Institute there was no instance of a primary cavity at the base. Cavities at the base, however, associated with disease at the apex are not uncommon, particularly when the disease is advancing rapidly.

It is frequently stated that a cavity must have attained the size of an English walnut before it will give signs sufficient for its recognition and if the usual signs such as cavernous or amphoric breathing, whispering pectoriloquy, vocal resonance, etc. are depended upon, this may be the case. The experience of Neumann and Stoerk of Vienna, however, show that a musical resonant, or musical consonating, rale is always indicative of a cavity, usually of small size.

Fresh cavities are lined by an irregular membrane and give a musical resonant rale, while large, smooth walled cavities give metallic rales or metallic breathing which is much better heard with the naked ear than with a stethoscope. This metallic breathing is hard to describe. It is of a very dry rasping quality, a sharply accentuated bronchial breathing.

Rales from a fresh cavity are more sibilant, finer, higher-pitched and closer to the ear than the consonating rales of consolidation. They sound somewhat like the burning of fat close to the ear and are sometimes the only physical sign of a cavity to be found.

Metz Building.

## THE PHYSICIAN'S SERVICE TO THE PUBLIC.

DR. G. W. MOORE,  
MUNGER, MICH.

(President's Annual Address)

It is gratifying to note that the medical profession continues energetic in the application of the altruistic principles for which it stands; that it maintains advanced positions in the fight for better things and conditions.

Further, it is confirmatory of the trend of our influence, that no great movement looking toward the betterment of the race giving any degree of promise of success is without the energizing help of one or more of the members of our profession.

Illustrative of this is the fact that the National Conference on Race Betterment that convened, in Battle Creek on January 8-12, and composed of men and women of the greatest prominence in the United States, had for its president Dr. Steven Smith. To review the long list of officials and speakers chosen for this conference, and note their worth and prominence, will enable us to appreciate the honor done us in selecting a physician as leader.

But a few years ago the physician's voice had but little weight upon any subject affecting public interest. Men of prominence in the profession later began doing spectacular things, such a cleaning up the dirty Central American conditions, and making the Canal possible, and Dr. Wiley's noble stand for purity and efficiency, have made a strong impression upon the popular mind as touching the importance of the physician's usefulness to the public. Yet I want to call attention to the fact not so plainly thrown upon the curtain, that the rank and file of the physicians of the land, have, through the strength derived from organization, and from the consciousness of a noble mission in life's activities, exerted a steady and resistless influence commanding public attention and respect. But a few decades ago it was almost impossible to secure legislation for measures affecting the public health, because of a suspicion that some member or members of the medical fraternity were behind it for selfish purposes; or, that it might interfere with the standing of some school or cult. These things are not yet entirely eliminated, but are giving away before the pressure exerted by an organized profession. And as a result there will surely be a National Health Department in spite of Christian Science, "Osteo," and other "Pathies." The wheels of progress which are actuated by the medical body are driving to that end, at which time, solely as a result of the perseverance of our profession, babies, chil-

dren and adults will be accorded the belated government care which selfish money interests secured for pigs and calves thirty years ago.

#### EUGENICS.

It would be presumptuous to ask your attention for anything like a full review of the subject of eugenics. I will, however, speak upon it briefly, for it appears to me as strongly indicative of the spirit of the times, looking toward the betterment of mankind.

Thoughtful consideration of the present day literature upon the subject makes obvious the fact that among those who have the best interest of the matter at heart, there exists too much diversity of opinion as to working methods to accomplish anything like hoped for results. Many advocate very free teaching of school children on the subjects of sex and heredity. Others, more cautious and perhaps more far-seeing, advise moderation in this teaching for fear of too strong suggestion to particularly susceptible minded children.

A large group of ministers, 3500 in number, and representing 50 ministerial associations, have accepted the leading of Dean Summer who served a year on the Chicago Vice-Commission and are requiring a certificate of good health before performing the marriage ceremony. Others are joining this movement as time passes. These men are not deluding themselves into the belief that refusing to marry unfit persons will prevent the said unfit persons being married. Yet they have faith that their attitude will radiate its influence for the improvement of the conditions which they and we would see remedied.

The Duhamel bill of the state of New York provided that health certificates should be furnished before the marriage could be legally performed. Opinion as to the practicability of the latter measure are so varied as to approach chaos. The Rev. Henry Wood writing in the publication *America* condemns both the action of the 3500 ministers, and the provisions of the bill. He asserts that in either case "the fundamental principles of human liberty are violated," and, further "that constitutional weakness in children is no impediment, and very often a very profitable means of attaining to the everlasting glory."

The want of unity herein portrayed can have but imperfect results. And it will seem to follow that the medical profession can, working in harmony, evolve a practical plan whereby children may be taught that fully and only which they can absorb with benefit to their years, their future and their posterity.

Dr. Eliot, late of Harvard, has predicted: "that the time will come when education will

be in the hands of the medical profession," emphasizing the truth that the human problem is the greatest subject in modern education.

#### ORTHOGENICS.

Heredity and environment are the forces that educators must study more, and study is needed of the special requirements of each delinquent and defective child. Orthogenics, or the science of correcting mental and physical defects whether or not of equal importance with eugenics should at least receive equal study and attention. It is well to work in the interest of posterity, but those who live with us need our care. Logically the direction of this work belongs to the medical profession—more, that the medical profession must direct the work or it will remain but little advanced, as a testimony to our negligence. Investigation of the standing of the school children in 31 cities in the United States revealed that one-third of the total were backward. Examination into and scientific classification of the mentality of these children should receive, it would seem, medical care. But imperfect education results can be had when normal and abnormal minded children are members of the same classes on a competitive basis. It is well known that the presence of adenoids or defective vision will contribute to delinquency, and examination for and correction of these evils should be continued and even extended; but having done this, the work is only well begun. A sad percentage of children are deficient or defective from birth, by reason of either the known or unknown causes of abnormality, and the work before the profession in this field leads us far into more observant and subtle depths than merely testing the vision range and feeling with the finger for adenoids.

School teachers are as a class hard working and conscientious, but can it be expected that they qualify to analyze the degree of normality of each member of their large and varying classes?

A strong movement has recently been instituted by articles in several magazines written by Dr. Josephine Baker, Director of Child Hygiene in the N. Y. Health Department, Dr. Dennet and others, interesting parents in the fact that the traditional slipshod methods of feeding and caring for babies is not the best either for the children or the parents; that better results are had and lives saved by learning the simple and correct thing to do. These articles of course reach but a small percentage of the people, obviously those who read this class of literature, but each mother interested is a focus for the radiation of interest in the matter.

Dr. Baker's work as director of child hygiene in the great city of New York is simply stupendous, and with 630 trained nurses at her

command, a great amount of help and instruction is being given the mothers among the poorer classes.

The difficulty encountered there, is, as every physician has experienced, not so much that mothers are merely ignorant of correct methods of care, as it is to eliminate the teachings of tradition and the example of home errors.

However, in spite of these difficulties the work of teaching the better care and feeding of babies must go on, and every physician should leave the impress of his individual instruction in every home to which he is called. Often this seems a thankless task but like other good effort, it will bear results. In fact it would seem that better conditions in general living methods should follow in the wake of every physician, and this obtaining no man can justly be called a failure.

#### THE SOCIAL EVIL.

It is not my purpose tonight to attempt to present to you an address upon the "social evil" but to touch upon it; distinctly to indicate the degree of progress which is being made upon it by that public mind, which, having freed itself from dogmatism is earnestly seeking a solution, based upon the facts as they exist.

Early in the summer I collected and reviewed investigator's reports and other data, together with published opinions of competent observers, with a view to the preparation of this part of my address. Later, and while in Edinburgh, I, in company with Drs. Gustin, Baird, and Tupper, listened to an address by Dr. Wood Hutchinson upon this subject. I found that he had made use of and quoted freely from some of the reports and records, which I had gathered for use at this time. In a masterly oration he presented deductions showing that new hope has been instilled into those who have the reasonable solutions of the problem at heart, by the fact that new light has dawned upon its causation.

Scientific tests have shown that of a sufficient number of prostitutes to maintain the law of averages, that from 50 to 80 per cent. exhibit one or more of the stigmata of degeneration. And this of a type, proving that instead of the defect being of such nature as to incline them to adopt this mode of life, they are thereby rendered unfit and unable to do work in the world's activities in competition with normally balanced and constituted females. ..

It was found too that in a large per cent. of cases that the prostitutes were unable to perform consecutively simple movements of the hands required of girls in industrial employment. And that this defect in co-ordination of muscular action was of such degree as would cause them to be failures in competition

with normal woman. Close inquiry into their history often confirmed these findings.

It has been found, further, that they were but seldom actuated by abnormal sexual desires in choosing this life, but on the contrary were apathetic in this regard. So that it is evident the difficulty is not so much how to get them to change their way of living as to discover some way by which they can earn their living in a regular and honest manner. They are, in short, imperfectly developed and co-ordinated human beings, and hence it follows that the rational solution of the problem which they present logically devolves upon the medical profession. Further, it seems to me equally logical that isolated and few workers cannot accomplish the whole work. That the thoughtful interest of the whole upper stratum of society is needed to inspire and support those who are making the question a special work and study. When it has become obvious to all that its continuance under our present various systems of ineffective control is absolutely poor business procedure, a good basis will have been established on which to build practical work. Unorganized efforts of either individuals or societies cannot accomplish the work. It must have united effort and purpose. The medical profession as it stands today is able to powerfully influence public opinion, looking toward the betterment of the conditions of the unfortunates who have gravitated from a state of incompetency to that of depravity or criminality. The question presents aspects both economic and medical. Both economists and physicians have in the past evaded their duty. The politician has usurped the field and to his disgraceful profit. The politician should be eliminated, the economist should deal with the facts of the wasteful cost of the existence of the evil, and the care and employment of the unfortunate defectives who have become its victims; the physician should be a strong guiding influence in the recognition and care of these defectives, instructing as to their possibilities for usefulness. Professor Crum Brown in addressing an audience enunciated this truth: "We recognize that in the weakest there is a potentiality of strength, in the worst there is a potentiality of good, and it is our business to see that nothing is lost that we can help to save."

Professor Brown's view of our civilization is commanding and embodies the need of our help. When the physician's life work was bounded by the outlines of physical pain and injury, his limitations were indeed narrow. His broader work is to benefit the human race; to advise and teach unto better conditions, operative for the development of better physical human life; to promote that evolution of the human mechanism unto one stronger to react to its normal and abnormal environment, more



potent to resist the under mining influences of the defective contents inherent in its component heritage. He is willing that the sufferers from body defects should demonstrate the superior inclination to religious attainment, but refuses to be satisfied with any thing less than our best effort being put forth to radically change for the better their present conditions.

Our views are out reaching; the social evil question is becoming to be seen as being a much broader one than it was formerly thought to be. In the dawning perspective it is seen not to be the entity it formerly seemed, but involves other strata and classes in the social scheme. The competitive unfit in the female becomes a prostitute. The male who by reason of his mental and physical instability less than insanity and imbecility cannot maintain his place in the human line, becomes the hobo, the burglar, the habitual criminal.

To allow either to unrestrainedly demonstrate their ability to react to the social scheme is clearly illogical, expensive, and in total, a failure. Punishment after their demonstration is made but slightly serves for good, and is equally illogical. And more than being a near failure, it acts as a two edged sword, brutalizing in some degree those who administer it. Reference to authentic reports on prison scandals in our own state will confirm this statement. No Utopian plan is likely to be made operative whereby all these evils will be entirely removed, but much ought to be accomplished by intelligent concerted action, based upon our broader view of the situation.

My ideals may be far fetched but I have an abiding faith that it will eventually be by the influence of the medical profession of the world that the brutal crime of war will be abolished; that its memory will become to us more horrible than that of the private war of dueling, which like Saul "only slew its thousands." A more or less distinct history of the world for somewhere between six and seven thousand years proves that the politicians or money interests promote and that the clergy fail to prevent it. Indeed many pulpits have belched forth the red-hot lava of the war spirit.

For centuries medical men have presented a grotesque picture on the battle-field; as the machinery of war plied its mutilating work doctors go unto the very teeth of danger to remedy as they may, what is being scientifically done to destroy body and life. Wilhelm Lamzus, of Germany, is one of the first writers with the courage to depict war as it is, and strip it of the false garment of glory in which historians from the inception of record both legendary and written have sought to clothe it. Writers of power have found it easier to imitate their predecessors and make of their battle account an epic, being sure of winning royal

favor and applause. Lamzus' iconoclastic book brought down upon his head the wrath of the German Emperor who promptly proscribed it. This action, however, is a pretty sure way of making a book popular, and already it is being widely read. Its attitude is that which we as a body should assume. The loss of property has often been described, but there is a winning as well as a losing side and the gamble goes merrily on. But the medical world should demand that the human body, which we devote our lives to the preservation of, be not made the target of deadly war.

I wish at this time to express my appreciation of the many courtesies which have been extended to me during the past year. Indicative of the kindly attitude of the members of our society has been the absence of criticism of error in technic in the administration of this office; to any possible one who may have been an exception to this general rule, I will say that fault finding was hardly needed for an error was no sooner made than recognized and regretted by myself, being not so much the result of ignorance of parliamentary usage, as having grown out of touch with its practice. And I have not only benefited by the experience of this office during the past year but I have also acquired the mental attitude of leniency toward others whom I have seen to be also imperfect in assembly.

By giving credit where it properly belongs, to the work of the secretary and committees and the response of the members, I can safely make reference to the fact that the past year has been one of the thoroughly good years in the history of the society. Indeed, I estimate that it will be remembered as among the best.

My best wishes go with my successor in office for an ensuing year which will, if possible, excel this which is just ended.

And it may be that fate will give me life and leave to row once more—

Set some strong man free for fighting as I take awhile his oar,

But today I leave the galley. Shall I curse her service then?

God be thanked—whate'er comes after, I have lived and toiled with Men.

#### THE USE OF BACTERIAL VACCINES IN GENERAL PRACTICE.\*

C. T. PANKHURST, M.D.

NORTH STAR, MICH.

The use of vaccines in their therapeutic application for the prevention and treatment of disease, is a very extensive and complicated study, and I shall be able to treat on the subject only briefly today.

\*Read before the Gratiot County Medical Society.

Immunity to disease may be either naturally acquired or artificially induced. Every person is to some extent immune to certain diseases. This immunity varies in different people, and for different diseases, and varies in the same person from time to time. You have all observed that in some epidemics some people will be exposed to an infection time and again and they will escape. This is natural immunity. This immunity may already be possessed by the individual; or, in the case of certain diseases, such as typhoid fever, small-pox, and some others, the patient acquires this immunity by having an attack of the disease that renders him immune from subsequent attacks for a certain length of time.

This phenomena has been observed almost from the beginning of the practice of medicine, but it has only been within the last twenty years that there has been any explanation of this phenomena forthcoming.

Towards the close of the 19th century, Pasteur's discovery of bacteria began to show us what disease really was—an invasion of the body by some form of bacteria.

Next the problem was to find out how the system resisted the entrance of these organisms into the body, and how the system destroyed and rid itself of the bacteria once they had gained entrance to the body. In other words, the question to settle was what protective mechanism does the body possess to guard it against and to destroy disease.

A study of the blood soon showed that the protective substances of the body were here located, and then it was a question whether this protective substance was in the corpuscular part or the liquid or the serum part of the blood.

There were two theories advanced. Ehrlich and his followers contended that the protective substances were in the body tissues or the serum part of the blood, while Metchnikoff and his adherents claimed the resisting powers of the body lay in the phagocytic action of the leucocytes.

In 1895, Denys and Leclef called attention to the role played in blood serum in phagocytosis. They showed that by immunizing an animal against a certain micro-organism there was no change in the behavior of the leucocytes in themselves, but they found that in the blood of the animal so immunized there were certain substances which acted upon the microbes in such a way as to permit of their being ingested by the leucocytes. In other words, the immunity is due to a developed function of the serum and not to any change in the leucocytes themselves.

It was later shown that the action of the serum consisted not in a stimulation of the leucocytes, but in an actual combination with

the bacteria which thus prepared them for phagocytosis.

Somewhat later, Leishman, in an endeavor to determine the degree of immunity acquired to the course of certain infections, devised a method whereby mixing equal volumes of the bacterial suspension and serum from the individual whose resistance was to be tested, then taking a drop of this mixture on a glass slide and incubating it for fifteen minutes, then staining the preparation and counting the intracellular bacteria. By so doing he was able to show a parallelism between the intensity of the phagocytosis and the resisting powers of the body. But, the true significance of his observations escaped him because he considered his results as confirming the "Steinmelier theory" of Metchnikoff.

Wright and Douglas, in their researches, confirmed Leishman's work, but they modified his technic. By separating the bacteria, cells, and plasma they were able, by suitable combinations of these three elements, to inquire into the relative importance of each separate component in the general reaction. By using a solution of citrate of soda they were able to prevent coagulation of the blood, thus permitting a rapid separation of the corpuscles. Then these corpuscles are centrifuged and washed and centrifuged again. Then, by using an equal volume of the washed corpuscles, bacterial emulsion and serum from the individual, and incubating on a glass slide for five to fifteen minutes; fixing and staining the preparation, counting the intracellular bacteria, and compare this count to one made with normal serum, or with "pool serum," that is serum from a number of normal people, you have a comparison of the persons phagocytic count as compared to the phagocytic count of a normal person. This was called the opsonic index, and these substances contained in the human serum Wright called "opsonins." The word was taken from the Greek word "*opcovo*"—I prepare for food.

So at last we have come to believe that the principal protective and defensive mechanism of the body lies in the action upon the bacteria of the opsonins or antitoxines or antibodies of the blood-plasma.

This action upon the bacteria, by the opsonins, is thought to be in the nature of a ferment action. According to some of the latest investigations bacteria are thought to be composed of two parts; a central or nuclear portion and an external or cortical portion, and this cortical portion is in the nature of a peptone or mucin substance, and the action of the opsonins is to combine with and digest away this outer coating, so that the leucocytes can take them up and finish the process of destruction.

## VACCINES.

It is for the purpose of stimulating the body to elaborate more of these opsonins that we use the various vaccines or bacterial products.

The name "Vaccine" has been loosely applied to several bacterial preparations, such as bacterins, serums, antitoxines, phylacogens and sero-bacterins. A true vaccine, in the present acceptance of the term, means a bacterial emulsion, either sterilized by heat or phenol, or it may contain the living attenuated organisms.

Some of the more bold and venturesome of the profession have been using the living germs and are claiming even better results with these than with the killed organisms.

A serum is obtained, as you all know, by immunizing some animal and then drawing off the blood and separating the serum. With a serum you produce a passive immunity by injecting the antibodies into the patient with the serum, while in the case of the vaccines the system is encouraged to form these substances for itself. A bacterine is only another name for a vaccine.

Phylacogens are made by growing the bacterial cultures and then filtering off the germs and only using the "juice" of the "bugs" as it were.

Antitoxines are made by immunizing an animal with some bacterial toxine and then taking the serum which contains the antitoxines of this particular germ. Antitoxins act by neutralizing the toxins of the disease. The action is similar to the action of an alkali upon an acid.

Sero-bacterins are the newest preparations out, and are claimed to be a saturation of the bacterial emulsion with opsonins from serum of an immunized animal that has been treated with the same germ that you are dealing with.

It has been shown that when you inject a vaccine, for the first few hours the opsonins in the blood decrease in amount, due to the fact that some of the opsonins of the blood combine with the bacteria of the vaccine, and it is to prevent this primary lessening of opsonins that this new form of a serum and vaccine are used. The manufacturers claim that with this combination you get little or no local or constitutional reaction, and that the dose can be used much larger and repeated more frequently than with an ordinary vaccine. If such proves to be the case this seems like the ideal preparation we have been looking for. The only objections I can raise to it is the cost, which is \$1.50 and upwards, according to the dose used, and the added length of time required to make the serum. In the case of some acute lesion an autogenous preparation of this kind would be out of the question.

Vaccines are either stock vaccines, that is a vaccine made by combining several strains of

the same organisms from several different people, or they are autogenous, that is you make the vaccine from the predominating micro-organism that is infecting your patient.

If you are equipped to determine the opsonic index you can frequently tell what germ you are dealing with by taking the index of the patient for each germ in the case until the right one is found, and make the vaccine from this. There is one objection to this method, you frequently have a mixed infection and your patient will not respond well under treatment until you use a vaccine containing all the germs infecting that particular case.

Most stock vaccines are mixed vaccines having three to five or more of the germs most commonly met with in that part of the body where the infection is located that you are going to treat. Take for instance if you were going to treat an infection of the mouth or throat, you would expect to find some of the following germs present: the micrococcus catarrhalis, pneumococcus, Friedlander's bacillus, streptococcus, staphylococcus, influenza bacillus, etc. In the tonsil we frequently find the streptococcus hemolyticus, streptococcus viridans, and at times the tubercle bacillus.

In diseases about the colon or rectum you find some of colon family; micrococcus catarrhalis, cocci, and the pus forming germs.

On the skin most commonly are found the staphylococci and acne bacilli. A great many of the cases of boils and carbuncles and abscesses are due to the pus cocci. Erysipelas, Ludwig's Angina, many of the rapidly fulminating infections and septicemia scarlatina, and often in puerperal sepsis and pelvic cellulitis we have the streptococcus to deal with.

Where you have a rapidly spreading infection with a great deal of pain and a severely sick patient, you can be pretty sure you have a streptococcus to deal with; and just a word here about serums—if you have such a case on hand give a big dose of antistreptococcic serum, and you stand a good chance to save your patient, but you surely will have a slim chance if you wait for a vaccine to act.

## THE ACTION OF SERUM.

A serum begins to form a passive immunity as soon as it reaches the blood, while a vaccine does not help your patient any for a week or ten days, or until the system can elaborate opsonins to take care of the infection. Therefore in acute cases if you wish a quick action you should use a serum.

In a case of pustular acne you must probably have a combination of the acne bacillus and the pus cocci. In chronic bronchitis we find pneumococci, micrococcus catarrhalis, streptococci, etc. In leucorrhoea and gleet, and inflammations of the genital organs we find the gonococcus,



tubercle bacillus, colon bacillus, and the pus cocci. So you see, by studying your cases, you are able to guess with a fair degree of accuracy just what micro-organism you are dealing with, and then if you are using stock vaccines you can test out a dose or two and see how your patient reacts. If you get no reaction you have used the wrong vaccine, or have used too small a dose. The surest way is to use a reliable mixed vaccine. While you may give some organisms that are not concerned in the infection, they cause no ill effects and do not influence the action of the germs concerned in the disease you are treating.

I have, at times, seen some secondary infection clear up while treating the primary infection with a mixed vaccine.

I have been using vaccines for about four years, and I graduated successively from single vaccines to mixed vaccines, and from mixed vaccines to autogenous vaccines, and now am quite positive of my diagnosis when I use a vaccine with but a single germ, and I only use stock vaccines in case I am in a hurry to start a patient on treatment. I only use the stock vaccine until I can have an autogenous vaccine made.

It is only rational to think that when several different strains of the same germ, from several different individuals, vary widely in their virulence and general behavior, that we would get better results by taking a culture of the organisms, that are infecting our patient and making the vaccine from this, rather than use a vaccine from some member of the same family to which this organism belongs.

Some organisms under different conditions of nutrition, temperature, etc., show entirely different characteristics. Paynton and Payne have been able, by using the pneumococcus to start with to produce a germ they called streptococcus hemolyticus, and with this germ they caused multiple arthritis in dogs. Then by altering the conditions a little they produced the streptococcus viridans, and with this germ they caused endocarditis in animals. Thus going to show that presumptive evidence is quite strong that these three diseases, pneumonia, arthritis and endocarditis, are caused by the same germ having slightly different characteristics.

It is thought that rheumatism and chorea are closely related. Perhaps the same germ under different conditions causes the two diseases. The same may be said about the resemblance of the tubercular bacillus, spirochete of syphilis and the bacillus of leprosy.

#### AUTOGENOUS VACCINES.

You all know the method of preparing a vaccine. Some of the secretions from your patient are taken and planted in various culture media, and also examined under the mi-

croscope to ascertain what germ or germs you are dealing with. Then you make a transplant onto a nutrient agar slant, and when a rich growth has taken place this is washed off with normal salt solution, and some of the bacterial mixture is mixed with an equal volume of blood and the red cells are counted, and also the bacteria in the same field, and these are compared, estimating 5,000,000 reds per cubic millimeter, and you have a simple problem to tell the number of bacteria per c.m., and also in a cubic centimeter; then the dilution is made so that the average initial dose will be one c.c. or some fraction thereof. Different manufacturers advise different sized doses. The average initial dose for the following more commonly used vaccines is as follows:

Influenza bacillus .....	50,000,000
Staphylococcus, aureus ..	200,000,000
Staphylococcus, albus ..	200,000,000
Staphylococcus, citreus ..	200,000,000
Streptococci .....	20,000,000
Pneumococcus .....	5,000,000
Micrococcus catarrhalis..	50,000,000
Acne bacillus .....	50,000,000
Colon bacillus .....	50,000,000
Gonococcus .....	50,000,000

The matter of dosage is perhaps the hardest part of vaccine therapy to master. To know just how much of a dose to use, and just when to repeat the dose is to be determined for each case. The more I use vaccines the more I am impressed with their peculiarities.

#### DOSAGE.

The opsonic index, as a guide to dosage, has many disadvantages and uncertainties about it, and it requires a great deal of skill to use it so that its practical value for ordinary practitioners is almost nil. But there are simple rules to go by that we can safely employ, and can use vaccines with very good success in many lines of work.

There are many conditions that influence the size of the dose to be employed. The extent of the infection is a very important one. I find that in extensive infections it is best to give a small dose to start with, and increase the dose more gradually. Infections in vital structures, such as the eye, ear, etc., you would be more cautious with than when treating a case of boils.

Auto-inoculation plays a prominent part in determining the dose. There is a certain amount of auto-inoculation in most cases, and this is an immeasurable quantity to deal with. You have no way of estimating how much vaccine is being carried into the system from the source of infection. Then, when you start using vaccines most users employ some method to increase the circulation of blood through the parts affected in order that there may be more opsonins brought to the infected area, and this

procedure also carries more of the auto-inoculable material into the circulation, and in this way you may get an over dose of vaccine. Strong, robust individuals can stand relatively larger doses than weak and poorly nourished individuals. An overdose in such a person may break down the last bulwark of defense the patient has, and allow the infection to get a start you cannot overcome. Chronic cases stand relatively larger doses than acute cases do. In acute cases the rule is to employ smaller doses and to repeat the dose every two or three days. The best rule is to start with a small dose, say five million of the more active, and twenty to fifty million of the less virulent micro-organisms, and repeat this dose only when the last dose has begun to wear off, say three to four days, then five to ten days later on. The dose should be repeated before the disease begins to gain headway again, showing that your first dose has worn off. Do not increase the dose until the dose you are using fails to show any improvement in your case.

When you start a chronic case you can give the first dose and repeat in three to four days with a second one, and the third in about five days, and so on up to six or seven days, and gradually increase the dose a few drops at a time until you get some constitutional and local reaction, then go more carefully. I violated these sacred laws in some cases, and always regretted it afterwards. Your object in using the vaccine is to help nature fight a battle against some infection, but if you use too large doses, or repeat too often you lower your patient's resistance, and allow the disease to gain headway, and thus do more harm than you do good.

It is a good thing to get some local reaction at the seat of infection, that is what you want, but you do not want a marked constitutional reaction or local reaction at the point of injection. The ideal way is to carry your patient along gradually to a permanent cure of his disease with the least possible amount of discomfort and risk to him.

Vaccines should be injected subcutaneously in any convenient part of the body where there is a good blood supply. In the interscapular region of the back or on the outer aspect of the arm at the insertion of the deltoid muscle. A place should be chosen where the soreness and swelling, if there should be any, will cause your patient the least inconvenience. In making the injection care should be taken to avoid injecting the vaccine into a vein, because such an accident might cause a profound toxemia. A subcutaneous injection is absorbed more gradually than one given intramuscularly, and furthermore if you had a dose that would be proper for subcutaneous use, if this dose were given intramuscularly you would get a rapid

absorption and might get a harmful reaction.

The more I use vaccines the less dosage I employ. I think we are liable to pay too little attention to the fine points of the administration of vaccines and are liable to use them like we use our medicines, that is, give the average doses recommended and not study our cases carefully to determine the various conditions that may influence the dosage in each case.

The man who is successful in the use of vaccines is the man who pays strict attention to all the little details of the work.

#### PERSONAL EXPERIENCES.

I have used vaccines in that treatment of the following diseased conditions:

- Subacute Pneumonia.
- Chronic Bronchitis.
- Chronic Nasopharyngitis.
- Chronic Tonsillitis.
- Pulmonary Tuberculosis.
- Abscesses.
- Boils.
- Acne—Simple and Pustular.
- Otitis Media.
- Pyorrhea alveolaris.
- Gleet.
- Cystitis.
- Endometritis.
- Ulceration of Rectum and Colon.
- Puerperal infection.
- Gonorrhea arthritis.

Some of the more enthusiastic users of vaccines will tell you they are useful in almost all the acute and chronic cases of germ infection. Such has not been my experience. I find that chronic diseases are more amenable to treatment than acute cases, and that certain forms of infections respond readily and some very slowly or not at all to treatment, and some people are at too low a state of vitality for their system to respond to the production of opsonins.

There is one thing we must always bear in mind when using vaccines, and that is to make the circulation of blood as active through the infected area as possible so there will be as many opsonins carried to the point of infection as possible.

I find that staphylococci, colon bacillus, influenza bacillus and "catarrh coccus" infections respond well to treatment, but the pneumococcus, gonococcus and acne bacillus are much harder to kill out, and the streptococcus is among the hardest of all to eradicate. I have used a serum in acute streptococcus infections with good results, but chronic infections with this germ are very different to clear up.

I think that vaccines like the various other methods used in the treatment of diseases are all right when thoroughly understood and are

properly used. We have come to know that one of the easiest, quickest and safest ways out of a sharp attack of appendicitis is to turn the case over to the surgeon, and we will come, in time, to know that when we have a case of chronic bronchitis that instead of sending the case to Florida or Bermuda, and dosing them all the time, the best thing to do will be to have an autogenous vaccine made for them.

### THE DOCTOR AND HIS SUCCESS.\*

LEWIS S. RAMSDELL, M.D.  
MANISTEE, MICH.

It has often been the subject of my thoughts to take an inventory, so to speak of the position in society of the physician. To consider the mental attitude of people in general toward the medical man and to place myself, if possible, not only in the position of the patient, but also in the position of the prospective patient, and I say prospective patient with emphasis, because everyone, no matter how well and vigorous, while he may brag of his good health, in his sober moments feels in his heart that the time will come when he will require the services of a doctor just the same as he will require the services of an undertaker. This little inventory has led me to come to certain conclusions, and perhaps given me a bird's-eye view of the principles involved in the practice of medicine that I was not taught in college, and if I am right in my deductions, I will know it when I have finished my career; if I am wrong I will know it and I hope that if my declining years bring failure, and by this I do not mean financial failure, that I may be still broad enough to realize that this failure is due to the application of my principles evolved from these deductions rather than through the fault of the people to appreciate my ability or the profession to stand with me.

There are two sides to our lives—the sentimental and the practical. It is impossible for any of us to divide them equally or I might better say in the proper proportion and make them give us the proper balance, hence there is always a predominating evidence of one side to our make up. Some of us have a tendency to over estimate the practical side and others are given to over balance on the sentimental side. Perhaps, if we were sufficiently self-centered, we would cultivate the proper control and by study of ourselves make in a way a suitable relation between the purely sentimental and practical natures but if we are so self-centered this very condition would lead us to an improper balance toward the practical side.

Sentimentality and the finer qualities that

go to make up the softer side of our dispositions are spontaneous and spontaneity can not be cultivated.

A gentleman is a gentleman born and his actions which prove this are spontaneous. To be sure he can cultivate manners, he can even cultivate such a nicety of manners that he may almost deceive himself into thinking that he is a gentleman but the proper stimulus will bring out his true nature. Some time it will take a shipwreck or a theatre fire to prove this but the fact is there and there is no business or profession in the world that provides such a constant test of this quality as that of the medical profession.

You will doubtless say that a man may be a good diagnostician and be a cad. He may be a good surgeon or internist and be a fish. He may be a good collector and financier and be a success from his point of view and I will grant this. I will also grant that every one present is an excellent physician or at least we all think that we are excellent physicians or we would not be honest in continuing in our vocation and dishonesty is something we all abhor. This being true, why are some of us more successful than others? I do not mean financially, nor do I mean in the treatment of diseases, but true success, the success that gives us force in the community, and makes us mellow as time progresses leaving, when our time comes, a place that can be filled only in part. I have already granted that we are all excellent physicians, if anyone present is not, this paper is not for his ears. The practical side of our nature teaches us to be good diagnosticians, internists, surgeons, or whatever branch of the profession we see ourselves more adapted to. And yet some of us have more patients, some of us have more friends, some of us command more respect than others and as a result are more of a credit to the profession.

The diagnostician who is a cad will have the patients, minus the respect and friendship just so long as there is no other physician in the community who is as good a diagnostician and a gentleman. Than he will be a good diagnostician with the patients. The surgeon who is a fish will have the surgery in a community just so long as there is no other surgeon that is not a fish and then he will be a surgeon minus the patients and friends.

This teaches us that the successful doctor is not, as a rule, the purely practical man without the finer instincts, providing he has competition and success can not be measured without a competitor. Cultivation of the finer instincts will help but the results will not hold up against the competitor who has the instincts of a gentleman; I say competitor, as we are all competitors as well as colleagues.

The man who gives his diagnosis of a tuber-

\*Read before the Manistee County Medical Society, Jan. 26, 1914.



culosis to a patient in an unkind flippant or gruff manner hurts his patient; he may break her heart or shatter her nervous system in a word. He has demonstrated his ability as a diagnostician, but, he has not demonstrated that he has any feeling or finer instincts, in other words he has not comported himself as a gentleman in her eyes, and she would have about as much love and less respect for him than for the judge who pronounces the death sentence. She might respect his ability but the other fellow with equal or even less ability, and the instincts of a gentleman will be the one that will take care of her during her last hours.

Immorality and the graver offenses to society are not considered in this paper, they mean failure in any business. I am granting that we are all excellent physicians, all moral, good citizens. With all of these some of us are more successful than others and the conclusions I have come to are: that the sentimental finer sensibilities in us are what make the variations in our degrees of success, and while these qualities are fundamentally instinct and born in us and can never be completely controlled by cultivation, they are nevertheless the foundation of success and, while cultivation may help, it will not cure. But let us try and if it is not in us it will help our children and theirs. They say that in four generations we can make a gentleman.

### *Clinical Case Reports*

#### INTUSSUSCEPTION CAUSED BY MECKEL'S DIVERTICULUM.

(Report of two cases.)

DOCTORS ANGUS McLEAN AND C. D. BROOKS.  
DETROIT, MICH.

Meckel's diverticulum, the remains of the vitello-intestinal duct is a process or diverticulum springing from the lower part of the ileum from one to three feet from the termination the ileum. It is found in two per cent. of the cases examined. It is usually a diverticulum or cord a few centimeters long but it may extend to the umbilicus as a cord or a duct which may give rise to an umbilical fecal fistula, when it extends to the umbilicus or becomes adherent. It forms an adjacent peritoneal surface and a band beneath a loop of small intestine may be caught and strangulated.

Meckel's diverticulum, being an appendage of the lower portion of the ileum, is prone to about the same infections as the appendix. In a small percentage of cases chronic inflammation causes partial obliteration of the lumen. As the diverticulum becomes distended active peristalsis ensues, the inner coats are invaginated into lumen of the intestine, active peristalsis may be

transmitted to the walls of the ileum, toward the cecum with the resulting invagination of the ileum or intussusception and intestinal obstruction.

Unless the diverticulum becomes the seat of an infective process or partial obliteration, it does not cause symptoms, but when it is involved, the symptoms are usually allied to those of acute or chronic appendicitis and is very difficult to differentiate without laparotomy. Of course when intussusception ensues, diagnosis of obstruction can be made.

When in operating for appendicitis we do not find sufficient trouble to account for the symptoms, we should always inspect the lower ileum for diverticula.

#### REPORT OF TWO CASES.

CASE No. I. J. M. age 27. Referred to us by Dr. Frank Bowman. Married. Family history negative One brother had appendicitis, 1912.

*Past History.* Diseases of childhood. Enjoyed good health up to July 5th, 1910, when he was taken with cramp-like pains across the abdomen, which lasted one hour, tenderness across the abdomen below umbilicus for three days; had some fever; confined to bed for three days, so-called "Typhoid Abortive;" bowels have always been constipated, more so for the last three months. Never any vomiting, no blood in stools.

*Present Trouble.* Began Tuesday 9 A. M., Dec. 9th., with cramp-like pains across the abdomen, which seemed to localize in lower right quadrant of abdomen, nausea, vomited once, went to bed, tenderness and rigidity of right rectus muscle. Marked distention in right iliac region. Pain persisted all day, mind not clear, temperature 99, pulse 120.

*Operation.* Operated Dec. 9th., at 6 P. M., Diagnosis—appendicitis or partial obstruction. On opening the abdomen there was revealed an intussusception of the ileum two feet from ileo-cecal junction, due to inflamed Meckel's diverticulum inverting and obstructing lumen of gut; upon withdrawal of the intussusceptions, the Meckel's diverticulum was found completely gangrenous; the bowel was dark red and in some portions almost black, but after continued application of hot moist saline pads for about fifteen minutes, it recovered sufficiently so that we decided it was safe to return it to the abdomen. The diverticulum was removed along with a small segment of the bowel. The patient made an uneventful recovery.

CASE No. II. Age 56. Personal and family history negative.

*Present History.* Two months duration. No acute condition, pain, (colicky in character) over whole of abdomen—more intense over McBurney's point; no vomiting, no nausea, bowels regular and appetite good.

*Examination.* Slight tenderness and rigidity on deep pressure over appendix, no palpable tumor.

*Operation.* Four inch right rectus incision. Its middle opposite the umbilicus; appendix normal; gall bladder normal; mass was detected three inches from the ileo-cecal junction with partial closure of the lumen of the intestine. This appeared to be a partial-intussusception which could not be reduced so three inches of the ileum was resected and an end to end anastomosis was made.

*Pathology.* The mass proved to be an end ulcer-

ated diverticulitis with an invagination of the diverticulum drawing in after it on each side about one inch of ileum, leaving the lumen of the intestine about a half an inch in diameter. This was so firmly adherent that on reducing it the intestine was torn through. The diverticulum was about two inches in length and three-fourth inches in diameter and had ulcerated through at the tip.

## REPORT OF A CASE OF LOWER TRACHEO-BRONCHOSCOPY FOR THE REMOVAL OF FOREIGN BODY.

JOHN R. ROGERS, B.S., M.D.  
GRAND RAPIDS, MICHIGAN.

Saturday evening, February 28th, I was called to see P. H. an infant of 17 months. The following history was elicited.

*History.*—On the previous Wednesday evening the child had been given a salted peanut by his older brother, and while chewing it had contrived to inhale a portion into his trachea. The mother on entering the room had found him dyspnoeic and cyanosed. She removed some pieces of peanut from the child's mouth, and by inverting the infant succeeded in relieving in a measure its attack of choking. After this the child breathed fairly well at times, but had recurring attacks of cough, cyanosis and dyspnoea, some of them very severe, and also gave evidences of pain and distress in the chest. The next day (Thursday) a physician was consulted, who is said to have put his finger down the child's throat, telling the parents that the obstructing foreign body had been pushed down. The child's symptoms, however, were not relieved. According to the mother's account it was not able to breathe except in the sitting posture, it refused nourishment and was listless and apathetic, with frequent seizures, described by her as "choking spells." This continued until Saturday evening, when after an unusually severe attack, I was hurriedly called.

*Examination.*—The child was sitting up in bed and had a distinctly sick and distressed look, respiration was hurried and labored, but there was no cyanosis. On inspection the right side of the chest showed diminished respiratory movements, with a corresponding increase of respiration on the left side. A laryngeal inspection was not attempted at this time.

Auscultation revealed large moist râles over the whole of the left chest; on the right there were loud whistling râles better heard at the back toward the lower border of the scapula. At a point corresponding to the second interspace in front, and downward there was a noticeable diminution of the breath sounds. On percussion there seemed to be at times a tympanitic note on the right which was absent on the left. After consultation with two physicians, the diagnosis was made of a foreign body in the right bronchus partly obstructing respiration.

*Operation.*—The child's condition not being immediately alarming at this time; it was removed to Butterworth Hospital. There, under chloroform anesthesia, a direct inspection of the larynx with the illuminated laryngoscope was made. The larynx and surrounding structures were found to be somewhat edematous but no foreign body was seen.

On account of the small calibre of the trachea and the probable small size of the foreign body it was decided not to attempt to reach the latter through the glottis, but to do a low tracheotomy and explore the bronchi in this way. This was accordingly done. The foreign body was found on the

right side of the first bifurcation of the right bronchus, at a point corresponding with the second interspace in front.

The foreign body was removed by three introductions of the forceps, and was broken up into five pieces by the crushing action of the instrument. The pieces when assembled made up a wedge-shaped body measuring about five and one-half millimeters at the base and six and one-half millimeters along the sides; thickness irregular, but approximately 2 millimeter. The apex of the wedge was located in the bronchial tube at its first bifurcation, the base projecting into the lumen of the larger bronchus.

*Post-Operative Course.*—Temperature just before operation was 102.4; pulse 160; respiration 64. A few hours later temperature had dropped to 99; pulse 120; respiration 40. For a few days the temperature fluctuated slightly from 98.8 to 100; respiration from 30 to 40.

In two days after the operation the child was apparently quite normal, and has made an uneventful recovery, being discharged from the Hospital on Monday, March 9th.

The Chevalier Jackson bronchoscope was used.  
525 Metz Building.

## PROPAGANDA FOR REFORM.

**AMORPHOUS PHOSPHORUS.** Amorphous or red phosphorus is chemically most inactive and pharmacologically is generally considered without action. Now Dr. I. L. Nascher proposes amorphous phosphorus as a remedy of remarkable value for arteriosclerosis of old age, but produces no reliable evidence for his claim. Based on Nascher's assertions Sharp and Dohme advertise Pill Phosphorus Amorphous S. and D. as a successful method of treatment for senile arteriosclerosis. The asserted actions of amorphous phosphorus are such as may be calculated to appeal to the sexual neurasthenic and the advertisements are likely to bring about an extensive use of the drug by the uncritical. The psychic element which plays so large a part with the sexual neurasthenic will bring favorable reports on the drug—at least for a while—just as one time ordinary phosphorus had a vogue (*Jour. A.M.A.*, March 7, 1914, p. 793).

**THOXOS.** Thoxos is offered to physicians by John Wyeth and Brother for the treatment of rheumatism, rheumatic arthritis, gout, etc., with the following incomplete statement of composition: "It is a palatable solution of Strontium and Lithium soluble salts, thirty-two grains, combined with twenty-four minims Wine of Colchicum Seed and a vegetable alternative, in each fluidounce, flavored with aromatics." From an examination in the A.M.A. Chemical Laboratory it was concluded that Thoxos contains strontium salicylate, lithium salicylate, small quantities of sodium salicylate, free salicylic and potassium iodid, and probably also colchicum and sarsaparilla. As strontium and lithium salicylate are generally considered to have about the same action as sodium salicylate Thoxos may be considered as equivalent to a preparation containing in each dose of one teaspoonful 3 grains of sodium salicylate with a fractional dose of colchicum and potassium iodid (*Jour. A.M.A.*, March 21, 1914, p. 949).

**RED PHOSPHORUS.** I. L. Nacher in a letter to the *Journal* states that he has had nothing to do with the exploitation of Pill Phosphorus Amorphous S. and D. He admits that he has no experimental basis for the use of this remedy and that his theory is simply a theory without facts to prove it. (*Jour. A.M.A.*, March 28, 1914, p. 1022).

# TRANSACTIONS

OF THE

## Clinical Society of the University of Michigan

Stated Meeting, March 11, 1914

The President, R. BISHOP CANFIELD, M.D., in the Chair

Reported by REUBEN PETERSON, M.D., Secretary

### *Reading of Papers*

#### A DIAGRAM OF THE HEART CYCLE, PICTURING THE CHANGES OF FORM OF THE AURICLES, VENTRICLES, CARDIOGRAM, AND VENOUS AND CAROTID PULSE CURVES.

WARREN PLIMPTON LOMBARD, M.D.

Professor of Physiology, University of Michigan.

The diagram which is here presented is brought before you, not because it contains any new facts, but in the hope that a picture of the series of phases through which the heart passes in the course of a normal cycle, and the synchronous changes in the form of the cardiogram, and the records of the venous and carotid pulse may serve as a basis for a discussion. Much of our knowledge of the action of the heart, and its relation to the circulation of the blood, has been in the past contributed by the scientific practitioner and it is probable that in the future we must look to the work of the clinical even more than of the physiologic laboratory for advance in this direction. Many of the points which are illustrated in the diagram are far from settled, and as divergent views cannot appear in a single scheme, it is necessary to present those which seem to have the strongest support and which fit into a harmonious whole. I know that there are many present who, through their daily study of the changes wrought in the action of the heart by disease, will be capable of suggesting important changes in the picture which is offered, and it is in the hope that such suggestions will be made that the diagram is brought before you.

The diagram assumes that a normal heart is beating at the rate of 75 per minute and that one complete cycle occupies eight tenths of a second. Each of the spaces enclosed by the

unbroken vertical lines is 0.1 second; and in the horizontal spaces, reading from above downward we see the duration of the systoles of the auricles and ventricles, and the period of diastasis; the time of occurrence of the heart sounds; the periods when the semilunar and the auriculoventricular valves are open; (the upper light band covering the period when the semilunar valves are open, and the lower light band showing when the auriculoventricular valves are open); the changes in the form of what may perhaps be regarded as a typical cardiogram; the waves of the venous pulse; two serial views of the changes of form of the auricles and ventricles of the right heart, the large arteries, and the position of the heart valves, (the upper series being given because it illustrates the action of the heart with respect to the associated waves of the venous pulse curve, and the lower because it pictures the relation of the heart to the pressure waves in the arteries); and, finally, at the bottom, a sphygmogram of the carotid pulse. Of course these schemes of the action of the heart are purely diagrammatic. The ninth heart picture on the lower line would be a truer representation of the heart. In fact, to bring out the effects of action, great liberties have been taken; only two curtains of the tricuspid valve are shown; the pulmonary artery is made to lie in close contact with the right auricle, although as it winds around the aorta, it is the aorta which is most intimately related to the wall of the right auricle; the right ventricle is pictured as forming the apex of the heart, although in fact it is the tip of the left ventricle which is the apex. The horizontal lines beneath each of the series of hearts represent the chest wall. Allowance has been made for the postponement of the venous and carotid pulse curves, by shifting them a little to the left, so as to bring them into closer relation to the processes upon which they are supposed to depend.



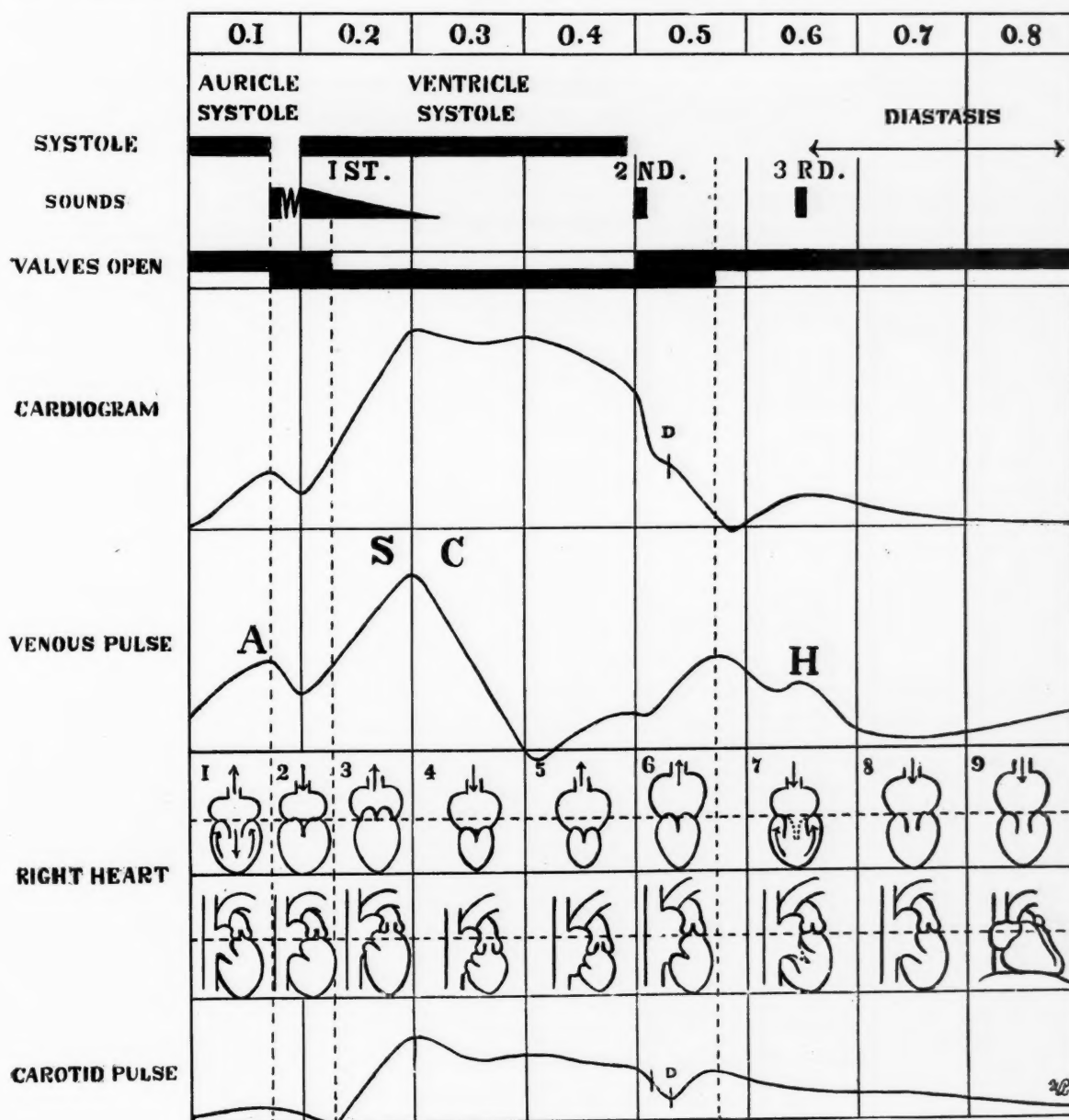
I propose to take up each 0.1 second of the cycle in order, and to review the processes depicted as occurring during each successive period.

#### THE FIRST TENTH OF A SECOND.

**VALVES.** The semilunar valves are closed. The auriculoventricular valves are open at

denly relax, (the relaxation is helped by the elastic recoil of the lung fibers which were stretched when the auricle contracted. This is especially true of the right auricle. Both auricles are, of course, affected by the continuous negative intrathoracic pressure).

**VENTRICLES.** The ventricles, already full, are suddenly slightly over-filled by the quick,



A diagram of the heart cycle, picturing the changes of form of the ventricles, cardiogram and venous and carotid pulse curves.

the start and are closed toward the end of the period, because of the brief, rapid injection of blood into the ventricles by the systole of the auricles, this being followed by an immediate relaxation of the auricle and an elastic recoil of the ventricular wall.

**AURICLES.** The auricles contract and complete the filling of the ventricles and then sud-

denly relax. Pressure currents are working behind the valve curtains, and the elastic recoil of the ventricular walls closes the valves.

**CARDIOGRAM.** The suddenly distended ventricle presses on the wall of the chest during the systole of the auricle, and then suddenly

lessens its pressure, as the auricle relaxes. The cardiogram records the auricular systole.

**VENOUS PULSE.** The record shows the "first positive wave," a pressure wave, due to the sudden increase of tension in the auricle as it contracts and completes the filling of the ventricle; and "the first negative wave," a negative pressure wave, caused by the sudden relaxation of the auricle.

**CAROTID PULSE.** A very slight wave is often seen, corresponding to the contraction of the auricle. These changes originate at the root of the aorta, and are caused by the expansion and the elastic recoil of the wall of the ventricle, as a result of the injection of blood by the auricle.

#### THE PRESPHYGMIC PERIOD.

This period falls between the two dotted ventricle lines, in the latter part of the first tenth of a second, and the first part of the second tenth of a second. It extends from the time that the auriculoventricular valves close, to the time that the semilunar valves open, that is, it is a period during which both sets of valves are closed.

**VALVES.** The first sound of the heart begins with the closure of the auriculoventricular valves, very early in the period, and the quality of the sound changes during the period, the valvular element merging into the sound waves thrown out by the cordae tendinae, and immediately after, by the muscle fiber of the walls of the ventricles, when they are suddenly put under tension.

**AURICLES.** The auricles suddenly enlarge at the very beginning of the period, so that the pressure falls below the ventricular.

**VENTRICLES.** The pressure falls suddenly for a brief period, as the auricles relax, and then begins to rise as the ventricles begin to contract, during the latter part of the period. As they contract, the ventricles harden; the apex is rotated forward, and to the right, so as to press more firmly on the wall of the chest; the ventricles begin to narrow laterally and anteroposteriorly, and probably lengthen somewhat.

**CARDIOGRAM.** At the beginning of the period, the curve falls, as the auricles relax, and then rises because of the increased pressure exerted on the wall of the chest by the contracting ventricle. This rise is the best mark that we have of the instant of the beginning of the contraction.

**VENOUS PULSE.** The "first negative wave," seen in the early part of the period, caused by the fall of pressure in the relaxing auricle, is immediately followed by the beginning of the

"second positive wave" due to the protrusion of the tricuspid valves at the beginning of the systole of the ventricle. The third heart picture, or rather one resembling it, belongs on the dotted line marking the close of this period.

**CAROTID PULSE.** The curve falls slightly because the blood is flowing out of the vessel into the capillaries. Occasionally a slight extra fall is seen accompanying the auricular relaxation.

#### THE SECOND TENTH OF A SECOND.

**VALVES.** The auriculoventricular valves keep closed, and are protruded into the auricles by the forceful contraction of the ventricles. The semilunar valves are opened shortly after the beginning of this period.

**AURICLE.** The auricle is tending to enlarge, but at the same time being encroached upon by the protrusion of the auriculoventricular valves from the contracting ventricles, and an upward push of the base of the ventricle.

**VENTRICLE.** The systole of the ventricles begins, and early in this period the pressure rises above that in the arteries, and the valves open, and the blood begins to pass out. The sudden tension of the muscle fibers contracting on the resisting blood causes the dull sound, which prolongs the first sound of the heart. Inasmuch as the sound does not last throughout the systole, it is unlikely that it is caused by the contraction process, as such. It is not unlikely that as the ventricle begins to contract it narrows from side to side and slightly lengthens, the base going up a little.

**CARDIOGRAM.** The curve is rising. The resistance of the blood in the aorta causes the hardening apex of the heart to press more firmly on the wall of the chest, and the resistance of the blood in the pulmonary artery helps to cause increased pressure on the diaphragm; (the systole causes a decided depression of the diaphragm, which is strongly felt by the hand when placed against its under surface.) Although the ventricles finally narrow in all diameters during systole, probably, at first, the narrowing is most in the lateral and anteroposterior directions, the blood being compressed by the swelling muscle, and the ventricle tends to lengthen rather than shorten.

**VENOUS PULSE.** The marked rise in the curve of the venous pulse, "the second positive wave," is generally attributed to the protrusion of the tricuspid valve curtains, caused by the rapidly increasing tension of the blood in the ventricle. This would hardly seem sufficient to account for the extent of the rise, although such a pressure wave, meeting the accumulating blood in the vein, would have considerable effect. It is not unlikely that in the early part of the systole the ventricle lengthens, and that

the whole floor of the auricle rising adds to the effect.

**CAROTID PULSE.** The primary wave begins to rise when the semilunar valve opens, that is, a short time after the beginning of this period, and 0.03-0.04 second after the beginning of the second positive wave of the venous pulse curve, the S wave, or, as it was formerly called, the C wave. This time relation, like the shape of the cardiogram and the two pulse curves, is altered by the effect of respiration. The primary wave rises rapidly and vigorously, usually to the full amount the systolic pressure can distend the artery. It is possible that the swelling of the root of the aorta, where it is in contact with the right auricle and the superior vena-cava, helps to cause the large second positive wave seen in the venous pulse curve; but as this usually starts before the primary wave of the carotid pulse, it is unlikely that the change in the arteries initiates the second positive wave.

#### THE THIRD TENTH OF A SECOND.

**VALVES.** All hold the same position.

**AURICLES.** The auricles are relaxing, and are being filled by the pressure of the blood accumulating in the veins. They are rapidly expanding and are being opened up by the elastic pull of lung fibers, (a pneumocardiogram shows an increase in the negative pressure in the chest due to contraction of the ventricles and this may slightly assist). Also they are filling because of the descent of the base of the ventricles, the floors of the auricles, caused by the combined effects of the shortening of the ventricles and the lengthening of the arteries, as the blood is forced into them. All this means that blood is being drawn out of the veins.

**VENTRICLES.** As they empty the blood into the arteries, the base of the ventricles descends at the same time that the ventricles shorten and the stretched large arteries lengthen.

**CARDIOGRAM.** The curve may continue to rise and may show a more or less level plateau, or may fall slightly, according to the character of the contraction of the heart and the resistance which the blood meets in the arteries.

**VENOUS PULSE.** The curves fall rapidly and very markedly, giving the "second negative wave." This is due to the rapid expansion of the auricles, and particularly to the rapid descent of the base of the ventricles, caused by their contraction and the lengthening of the large arteries.

**CAROTID PULSE.** A predicrotic wave may be seen. This is frequently an instrumental error. One thinks also of wave reflections from the periphery, and, since the aorta is in commu-

nication with the ventricle, of a wave of central origin, perhaps transmitted from the diaphragm.

#### THE FOURTH TENTH OF A SECOND.

**VALVES.** Toward the end of the period, the pressure of the blood in the sinuses of valsalva, causes the curtains of the semilunar valves to approach.

**AURICLES.** The rapid filling during the preceding period results in a slight elastic recoil. Also they are being pressed on by the swelling roots of the arteries.

**VENTRICLES.** They are continuing to draw together, and are completing the filling of the arteries.

**CARDIOGRAM.** The curve usually falls slightly, because the ventricles as they draw together, press less strongly on the wall of the chest. (In the diagram the apex is represented as leaving the wall, which of course it never does.)

**VENOUS PULSE.** Frequently a slight rise of the curve occurs, the introductory part of the V wave. This has been called the first onflow wave. It may be readily confused with a wave which is an instrumental error. It may be caused by the continued accumulation of the blood in the veins, and, as seems to me more probable, to a pressure wave from the auricles, resulting from an elastic recoil following the large inflow of blood in the preceding period.

**CAROTID PULSE.** The systolic plateau is generally falling slightly.

#### THE POSTSYSTOLIC PERIOD.

**VALVES.** This starts with the sudden closure of the semilunar valves, caused by the rapid fall of pressure in the ventricles and the elastic recoil of the roots of the large arteries. The closure of the valves causes the second sound of the heart. The auriculoventricular valves open at the end of the period, at the instant that the pressure in the ventricles has fallen below that in the auricles. In other words this is a period during which both valves are closed.

**AURICLES.** These are continuing to fill from the veins. The pressure is suddenly increased by the rapid rise of the base of the relaxing ventricles.

**VENTRICLES.** The ventricles are rapidly relaxing, and the sudden fall of pressure results in a quick closure of the semilunar valves at the beginning of the period, and the opening of the auriculoventricular valves at the close of the period.

**CARDIOGRAM.** A rapid fall of the cardiogram is seen, due to the dilation of the ventricle lessening the pressure on the chest wall. The



fall is interrupted for a brief instant, and a shoulder is seen on the falling curve; this shoulder is very likely caused by a pressure wave transmitted from the roots of the large arteries, when the relaxing ventricular walls withdraw their support.

**VENOUS PULSE.** The "third positive," the V wave, continues to rise, and bends up quite sharply, the bend starting at a time corresponding to about the middle of the descending limb of the dicrotic notch in the carotid curve, that is, just after the beginning of the relaxation of the ventricle, and at about the time that the second sound is heard. It is caused by a pressure wave developed in the right auricle by the sudden return of the base of the ventricle. The wave is cut short by the opening of the tricuspid valves, when the pressure in the auricle suddenly falls as the blood rushes into the ventricle.

**CAROTID PULSE.** The fall of the curve to the dicrotic notch starts at the very beginning of the period, just after the ventricle, as shown by the beginning of the fall of the cardiogram, begins to relax. The notch is the result of the withdrawal of the support of the root of the aorta, when the ventricular wall relaxes at the beginning or diastole. The following dicrotic wave is caused by the elastic recoil of the root of the aorta.

#### THE FIFTH TENTH OF A SECOND.

As most of this is taken up by the post-systolic period which has been just described, it will be unnecessary to consider it further.

#### THE SIXTH TENTH OF A SECOND.

**VALVES AND SOUNDS.** The auriculoventricular valves on the right side, the tricuspid, flap together for an instant, when a large amount of blood enters the ventricle rapidly, and produce a faint sound, the third sound of the heart. The effect is supposed by Thayer to be produced by pressure waves or currents reflected back along the wall of the ventricle into the spaces behind the valve curtains. (Einthoven who, as a result of experiments with the string galvanometer, places the sound 0.13 seconds after the second sound, says that it is due to an after vibration of the semilunar valves.) Similar effects might occur in the left heart, in conditions causing an unusual accumulation of blood during systole, and following a sudden inrush at the beginning of diastole, for example by mitral insufficiency.

**AURICLES.** The blood is leaving the auricles and filling the ventricles.

**VENTRICLES.** They are enlarging rapidly and filling with the blood.

**CARDIOGRAM.** Shows a rise due to the pres-

sure of the enlarging ventricles on the wall of the chest.

**VENOUS PULSE.** The "third negative wave," which started towards the close of the preceding period, continues its fall. It is due to the sudden lowering of the pressure in the auricle as the blood rushes into the ventricle. The fall is sometimes interrupted by a little wave, the H wave, which comes at the time that the third sound of the heart is heard, and under similar conditions. It is supposed to be due to a pressure wave caused by an elastic recoil of the wall of the ventricle, when it has been suddenly distended by the inrush of an unusually large amount of blood from the auricle.

**CAROTID PULSE.** Curve falling.

#### SEVENTH AND EIGHTH TENTH SECOND.

There is little to be said concerning these periods. Henderson has called the time from the third sound, that is, about the middle of the preceding period to the end of the cycle, the period of "diastasis." During this time the semilunar valves are closed, and the auriculoventricular valves open. It is this period that is chiefly shortened by moderate increase in heart rate. Both ventricles and auricles are at rest, and blood is flowing into them from the veins, completing the filling. The cardiogram has fallen to the base line. The venous pulse curve usually shows a slight rise due to the accumulation of blood in the veins. The carotid curve is slowly falling, as the arteries empty the rest of the blood which was received during the ventricular systole into the capillaries.

#### DISCUSSION.

**DR. ALBION W. HEWLETT:** It is very difficult to realize how much work is necessary in the preparation of such a diagram as has been shown, on account of the many divergent views that must be reviewed and reconciled. The carotid pulse which Dr. Lombard has drawn is the usual one; but when recorded by a sensitive instrument certain points of difference appear. There is a brief sharp wave preceding the main pulse wave and the dicrotic wave is also sharper and shorter than has been figured here. The study of abnormal venous pulses may throw some light on the interpretation of the normal. For example, two explanations have been given for the negative character of the normal venous pulse during ventricular systole. According to one it is due to auricular diastole, and according to the other, it is due to the descent of the base of the ventricles during ventricular systole. While both factors undoubtedly play a part in the production of the negative character of the venous pulse, there is some question as to which is the more important. During auricular fibrillation, the auricles are motionless and no diastole occurs. In such cases, the venous pulse commonly loses its negative character. It would appear from this that the diastole of the auricle is of great importance in producing the negative quality of the normal venous pulse.

**DR. JAMES G. VAN ZWALUWENBURG:** I should not discuss this exceedingly intricate subject if I had not spent considerable time in its study.

I am pleased to see the factor of the movements of the "base" of the heart emphasized as it deserves. It most clearly explains the phenomena of the venous pulse and of the cardiogram, and is exactly what one would expect to find from the study of the various physical factors involved, that is, the masses, velocities, inertias, etc. of the heart and its contents. Unfortunately these do not allow of mathematical expression.

I should like to extend Dr. Hewlett's comment on the carotid tracing to apply as well to the jugular. The tracing reproduced is a very typical example of a normal jugular as recorded by the ordinary instrument. However, when you use an instrument capable of recording 80 to 100 oscillations per second, the picture is quite different. It is also so variable that Dr. Agnew and I were wholly unable to reach a satisfactory solution of the problem of its analysis. It was hoped that simultaneous tracings with the intraauricular pressure curves would simplify matters. But those only introduced new problems.

One of the most important facts to be remembered in such a study is that, at the jugular, we record a volume-curve and not a pressure-curve. The distinction is a very real one. With a competent valve at the jugular bulb we may record only the results of the opening and closing during the time the valve is closed.

Altogether the problem is a very complicated one, as well as very interesting and I very much appreciate Dr. Lombard's simple exposition of the present state of our knowledge.

DR. LOMBARD (closing the discussion): I would like to say that I agree thoroughly with what has been said, that the carotid curve given on the chart, although of a form frequently obtained, is not really an ideal representation of the pulse curve. The nearest approach to what seemed to me to be an ideal pulse curve, I got by dissecting out the carotid of a rabbit, tying two ligatures about it, cutting between them, and then fastening the central end to a very light bamboo lever. The artery was stretched by each beat and the elastic oscillations of the wall were well recorded. With reference to the venous pulse, I will say that I have a tracing in the laboratory which is practically a duplicate of the one given in the chart. The venous pulse varies very much and the curves are not constant. The curve shown is perhaps a fair illustration of the time and shape of the oscillations which appear in such curves.

## HUMAN BLOOD SERUM THERAPY.

HOWARD H. CUMMINGS, M.D.

Head of University of Michigan Health Service.

Chemical studies of the human blood and physiologic researches on circulation and coagulation have solved many perplexing problems, but when we consider some of the common vascular phenomena and try to explain them we realize that much remains to be done. As an example, normal coagulation of blood proves to be a complicated process. Normal blood is supposed to contain a substance called prothrombin which enters into combination with calcium salts and an enzyme of unknown chemical structure called kinase or zymoplastic substance and forms thrombin. Thrombin unites with fibrinogen forming a clot. This is a

theory which appears reasonable but the clotting of blood is supposed by other workers, to be a simpler process. To explain the non-coagulation of blood in the vessels this theory goes farther and supposes that there is in the blood, a neutralizing substance to prothrombin called antithrombin. Likewise, antithrombin is supposed to be neutralized by tissue juices and thus allow clotting. In other words, the explanation of the common phenomenon, blood coagulation, is based on theory and is still unsettled. I mention this fact because in discussing the uses of human blood serum, I must admit that much is unknown regarding its action. However, is this not true in regard to some of our most useful agents? Think of the results if Jenner had failed to use the virus of cowpox because he did not understand just how it acted or its relation to smallpox. I know that there are many practitioners of medicine who know that human blood serum has been used successfully by men like Welch, but feel incompetent to use it because they have become confused in reading the literature. And this is not surprising if one is confronted by such expressions as, hemorrhage due to lack of blood platelets, antithrombin and fibrinogen; serum sickness; anaphylactic shock; deaths from serum injections; and acute hemolysis due to blood transfusion.

Human blood serum is the liquid portion of the blood after coagulation has taken place. When it is obtained from a healthy person and collected in a sterile condition it is one of our most useful therapeutic agents in combating hemorrhagic disease. I will briefly mention some of the explanations or rather theories of its action. Human blood serum when injected into a person suffering from a spontaneous hemorrhage or from persistent hemorrhage due to rupture of small vessel walls, causes cessation of bleeding. This action is supposed to be due to a shortened coagulation time or to an increased firmness of the clot. The serum injected is supposed to furnish kinase, prothrombin, calcium or fibrinogen. Whipple<sup>1</sup> has reported hemorrhage in a case of septicemia due to antithrombin; also a case of melena where prothrombin was absent, and a lack of fibrinogen in a fatal dose of hepatic cirrhosis. Duke<sup>2</sup> finds that blood clots slowly when the blood platelet count is low. Morowitz<sup>3</sup> believes that there is a lack of an enzyme kinase or thrombokinese. King and Stewart<sup>4</sup> explain slow coagulation in cases of jaundice as due to a union of calcium and bile pigment,

1. Whipple, G. H.: *Arch. Int. Med.*, 1912, IX, 365.

2. Duke, W. W.: The relation of blood platelets to hemorrhagic disease, *Jour. Am. Med. Assn.*, 1910, LV, 1185.

3. Morowitz, P.: *Handbuch d. Biochemischen Arbeitsmethoden* E. Abderhalden, 1911, V, 223.

4. King, J. H., and Stewart, H. A.: *Jour. Exper. Med.*, 1909, XI, 673.

free calcium being decreased. Conradi<sup>5</sup> has isolated a substance which inhibits coagulation; this he calls antithrombin. Summarizing all of the theories we must explain the action of blood serum in one of the following ways:

1. The introduction of blood serum supplies one or all of the substances necessary to produce coagulation.

2. Blood serum stimulates the blood forming organs to supply the substance which is lacking and causing the bleeding. This theory has been advanced by Cooley<sup>6</sup> in a recent paper.

3. Blood serum neutralizes antithrombin or other toxic substances which are inhibiting coagulation.

4. Blood serum has an action on damaged cells of the vessel wall. This is believed by Welch.<sup>7</sup>

5. Blood serum neutralizes toxins which are damaging the vessels.

During the last three years, I have used human blood serum in a variety of cases, most of the work having been done in the department of obstetrics and gynecology of the University Hospital. A modified Welch apparatus for obtaining the serum, was used in all of the cases. I will briefly describe this simple and satisfactory device. A small Erlenmeyer flask is fitted with a two-hole rubber stopper. Two glass tubes, one longer than the other, and both bent, are inserted into the flask. One tube which is used as a suction tube, is connected with the rubber and tip of an ordinary blood counting pipette. Inside of the rubber tube is a small glass bead which fits tightly and acts as a valve when the rubber is not forced away from it. Inside of the glass tube, a small amount of cotton is placed to prevent saliva from contaminating the interior of the flask. The second glass tube is connected by a rubber tube with a salvarsan needle. The apparatus is allowed to boil in normal salt solution for five or ten minutes, when it is ready for use.

The donor's arm is prepared and a rubber ligature passed about the arm above the elbow. The needle is thrust into the basilic vein and by making suction on the blood counter tip the flask can be filled quickly. When the required amount of blood has been obtained, the rubber cork and glass tubes are removed and the flask is plugged with sterile cotton and set away in a cool place. It is well to place the flask, slightly tilted, in a bowl lined with cotton. Within one-half hour about 20 cubic centimeters of serum will separate from 80 cubic centimeters of blood and after a few hours about one-half volume of serum will be removed.

When it is necessary to act immediately, I use the fresh blood, injecting it under the skin of the abdomen, between the shoulders or into the arms or legs. In weak children a hot water bag placed over the site of injection, hastens absorption of the serum. The following facts can be relied upon in using human blood serum:

1. It is nontoxic whether given in small or large doses.

2. No anaphylactic reaction results whether injected at short or long intervals.

The histories of some of the patients treated will be of value in illustrating the use of human serum.

CASE 1. Obstetric Number 675, Mrs. E. F. age 40, was admitted to the Maternity Service on April 3, 1912. The family and personal histories were negative until the present trouble which began five years before. The patient had been pregnant nine times and all had gone well until the fourth month of her eighth pregnancy, when she began to have hemorrhages from the rectum. A marked anemia developed and her physician induced labor. From that time until her present pregnancy she had been free from the rectal hemorrhages but they had returned during the fifth and sixth months of this pregnancy. An examination showed a very anemic woman about seven months pregnant. There was edema of the whole body and marked pigmentation of the skin. A rectal examination showed dilated vessels in a very pale mucosa and in some places blood could be seen in the mucosa, but no actual ulceration was visible. The hemoglobin reading by the Miescher apparatus was 23 per cent. with a corresponding low blood count. Examination of the stools gave a strong blood test. The first nine days the patient was given a daily injection of 20 cubic centimeters of blood serum. At the end of this time no blood could be found in the stools. The injections were discontinued and blood soon reappeared in the stools. At the end of three weeks the patient's hemoglobin was 28 per cent. The daily dose of blood serum was increased to 30 or 40 cubic centimeters and the patient improved. On May 22, she went into labor prematurely, the hemoglobin being at this time 40 per cent. This patient received over 600 cubic centimeters of human blood serum and nearly every man in the senior class donated blood. Premature rupture of the membranes occurred with prolapse of an arm and the cord. The patient did not report the accident until the child was dead and a shoulder had become impacted. She was delivered manually without anesthesia and made a good convalescence.

The interesting feature of this case was the prompt disappearance of blood in the stools when serum was used, and its reappearance when the injections were discontinued.

5. Conradi, H.: Beitr. z. Chem. Phys. 1. c. Path., 1902, 136.

6. Cooley, T. B.: The treatment of hemorrhagic disorders, Jour. Am. Med. Assn., LXI, 1277.

7. Welch, J. F.: Am. Jour. Med. Sc. 1910, CXXXIX, 180.



CASE 2. Gynecologic Number 4832. Mrs. M. M., age 47, had borne two children and had been well until nine years before entrance when her menstruation became profuse and three years later she noticed a firm, smooth tumor arising in the median line of the abdomen. The flowing had increased until it had become almost constant. The patient showed generalized edema, and a marked secondary anemia with a hemoglobin reading between 10-12 per cent. Miescher. She had a hydropic fibroid of the uterus and ascites. The patient was flowing when admitted on February 20, 1913 and the next day 30 cubic centimeters of human blood serum was injected. On the third day the flowing had ceased and the patient was given injections of blood serum at intervals of a few days. She also received the usual treatment of rest in bed, Bland's pills, sunlight and wholesome diet. In slightly over three weeks, the hemoglobin estimation was 42 per cent. and the patient was operated upon and cured. In the ward at the same time were two patients with fibroids and severe anemia due to bleeding. These patients were also kept in bed, in the sunshine when possible, given Bland's pills and a wholesome diet. They improved but not so rapidly as the patient treated with the serum.

CASE 3. Gynecologic Number 4728. Miss F. P. age 13 years, entered the hospital January 2, 1913, suffering from menorrhagia which began about six months before. The periods appeared about every two weeks and she would flow from eight to fourteen days. A curettage was performed but the endometrium proved to be negative. In May, 1913, she returned because the profuse flowing had reappeared. She was treated for twenty days with daily injections of 10 cubic centimeters of human blood serum and thirty grains of calcium lactate. The flowing ceased and did not recur during her stay in the hospital. The subsequent history is not known.

CASE 4. Gynecologic Number 5144. A young girl age 18, giving the same history as the one just related, was treated with human blood serum, horse serum, and calcium lactate. The bleeding was controlled but the patient spent several uncomfortable days with her giant urticarial wheals.

Human blood serum in cases of melena has come to hold the position of a specific remedy since Welch's<sup>8</sup> splendid report, given in 1910. The results are nearly all uniformly good and the surprising feature is the control of bleeding by relatively small doses. I have treated but one case of melena; the result of the serum therapy was good.

In 1912, Welch<sup>9</sup> called attention to the value

of human blood serum in cases of malnutrition in infants. The following case will illustrate its value:

CASE 5. Obstetric Number 661. Miss S., age 18, gave birth to a premature infant at the eighth month. The child's birth weight was about 4½ pounds or 2025 grams. The child nursed well until the twelfth day when it was nearly back to normal weight. Then he began to refuse nourishment and lost in weight very rapidly until at the thirty-second day, he weighed 1600 grams, having lost 404 grams in eighteen days. It was evident that the child was doomed if he continued his downward course for a few more days, so daily injections of 8 cubic centimeters of human blood serum were given. The first day the child gained 46 grams and each day he gained from 25 to 50 grams and was back to his birth weight after ten days of treatment. In the next sixteen days he gained 600 grams and was discharged when fifty-eight days old. Two other premature children were treated with blood serum and responded well.

I wish to relate the history of another patient.

CASE 6. I was called by Dr. John Holmes to administer blood serum to E. P., a boy, 9 years of age, who was having whooping cough and for three days had had a continuous epistaxis. This lad also had a congenital heart lesion which had been diagnosed as a persistent ductus arteriosus. A history of hemophilia in the males of the mother's family was obtained. An examination revealed a very anemic boy with a rapid heart rate. The nose was filled with soft clots and gauze packing. Perchloride of iron had been used in the nose, but there was a continuous slow ooze of blood from the nostrils.

The father gave some blood and 10 cubic centimeters of blood serum were injected into the boy's abdominal wall. A second injection was given one hour later. Within two hours the bleeding had practically ceased. Five days later the bleeding began again, but was promptly checked by giving 15 cubic centimeters of serum. The boy made a splendid recovery.

It is neither scientific nor right to draw conclusions from single cases but surely the histories reported suggest that human blood serum has a place in modern treatment. I do not wish to convey the idea that I consider human blood serum a panacea, for in three patients suffering from carcinoma of the cervix and bleeding profusely, I could not see a beneficial action. A child with a cerebral hemorrhage was treated but later died from pneumonia. I have tried human blood serum in a case of acute enteritis in a child of two years, but other treatments given at the same time made it impossible to note the effect.

8. Welch, J. E.: *Am. Jour. Med. Sc.* 1910, CXXXIX, 800.

9. Welch J. E.: *Am. Jour. Obst.* 1912, LXV, 597.

The injection of human blood serum does not compete with direct transfusion. The indications for direct transfusion of blood are clear. When a larger amount of blood is lost within a short time, or where red corpuscles are needed to carry nourishment to the vital centers, transfusion and not serum injection is indicated. Billings<sup>10</sup> believes that when a hemorrhage has not endangered a person's life, human blood serum rather than direct transfusion should be used. Vaughan<sup>11</sup> mentions the fact that transfusions are rather frequently done when the simple administration of serum would answer equally as well.

In hemophilia and melena neonatorum human blood serum has proven its great value, but I believe that this field of therapy is broader than we know and that many lives will be saved by it.

Malnutrition in infants has always been a stubborn condition and when far advanced, has frequently proven fatal. Here, human blood serum should be tried. In the cases observed it has operated as if by magic.

The injection of human serum in women with myomata and suffering from anemia severe enough to offer an obstacle to operative work is a large field. If the bleeding is controlled for a few weeks the blood condition will so improve as to make the operation without great risk. Esch<sup>12</sup> has reported three cases where he used defibrinated blood to control the hemorrhage from myomata. With three injections of 15, 20 and 22 cubic centimeters, he was able to raise the hemoglobin from 25 to 46 per cent. The three patients survived their operations. Esch<sup>13</sup> used defibrinated blood in treating a case of pernicious anemia occurring in the puerperium.

Surgeons have always dreaded operations upon jaundiced patients because of the frequency of primary and secondary hemorrhage. Not all jaundiced patients bleed but the liability is greatly increased. Undoubtedly here is a useful place for human blood serum therapy. Meyer<sup>14</sup> and others have reported excellent results where the serum was given for several days preceding the operation and in doses of from 30 to 60 cubic centimeters.

It is questionable whether human blood serum or the transfusion of blood can greatly benefit patients with pernicious anemia. The frequency of megaloblastic showers and the associated improvement make one suspect that the cures reported were only the better phase of this disease. However, in secondary anemias,

whether the source of the loss of blood is apparent or hidden, human blood serum offers great possibilities.

In closing let me say that with a therapeutic agent so abundant and so harmless and with a method so simple no physician should hesitate to try human blood serum. Serum from healthy individuals is absolutely safe to inject.

#### DISCUSSION.

DR. REUBEN PETERSON: This work of Dr. Cummings is not only interesting but of great importance. Serum therapy is especially indicated in the two classes of cases mentioned, bleeding fibroids, and melena neonatorum. If the uterine hemorrhage can be stopped great good can be accomplished with large doses of iron, but it is not always easy to control the bleeding by packing, for the hemorrhage may be high up in the uterine canal. In patients with hemoglobin below twenty per cent. it is dangerous to curette under an anesthetic. In such cases human blood serum should always be tried and usually will be found efficacious. Just before the publication of Welch's paper, I had a case in private practice which undoubtedly could have been saved by serum therapy. It is magical to see how cases of bleeding in the new born respond to injections of blood serum and fortunately they can be administered without danger.

DR. R. BISHOP CANFIELD: I have had considerable experience with the use of horse serum, but have used human serum in but one case and that in the hopes of building up the patient's resistance to infection. There is a new preparation of calcium known as calcine, which has seemed to be of decided importance in reducing the coagulation period. This substance injected directly into the buttock eight hours before an operation in which one expects to encounter hemorrhage seems to be of decided value.

DR. JOHN T. HOLMES: The patient I had Dr. Cummings see was a case of whooping cough in a child who had epistaxis and was in a very critical condition. I decided to start in with serum injections. We gave him fifteen cubic centimeters of serum with very good results, for the next day the hemorrhage had stopped. The child remained in fairly good condition for four or five days and then the hemorrhage started again. We gave another injection of serum and the child finally got well and is now in fairly good health. This condition was associated with a heart lesion which the child had had since birth. Dr. Marshall saw the case later and thought it was probably a patent ductus arteriosus.

DR. WARREN P. LOMBARD: I would like to ask Dr. Cummings what he regards as the cause of the increase in hemoglobin. I wonder whether by taking the blood from healthy individuals you got just what was needed. I wish to ask if the blood of the patient had been analyzed, and whether in any of the cases where the blood had been examined a lack of calcium had been found. I wonder whether the giving of calcium would have done the business.

DR. CUMMINGS (closing the discussion): I believe there is a field for human blood serum in cases of malnutrition. Welch has reported several cases where the serum was used successfully and our results were entirely satisfactory.

In answer to Dr. Lombard's questions, I would say that the cause of the rapid increase in hemoglobin is the cessation of the hemorrhage. It has been suggested that the serum stimulates the blood forming organs.

10. Billings, F.: Internal Hemorrhages: Can we control them? Jour. Am. Med. Assn., 1913, LXI.

11. Vaughan J. W.: Direct blood transfusion, Jour. Mich. State Med. Soc. XII, 582.

12. Esch, P.: München. med. Wehnschr., 1911, LVIII, 2154.

13. Esch P.: Deutsch. med. Wehnschr. Berlin XXXVII,

14. Meyer, Wiley: Surg., Gynec. and Obst., 1911, XIII, 152.

## THE NEW CONTAGIOUS HOSPITAL AT THE UNIVERSITY OF MICHIGAN AND ITS PROPOSED PLAN OF OPERATION.

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Professor of Obstetrics and Gynecology, University of Michigan.  
Medical Director, University Hospital.

Within a few weeks the new contagious pavilion of our Hospital will be fully equipped and ready to receive patients. It seems fitting, therefore, that a brief description of the building and its proposed plan of operation be submitted to the members of this Society, since we one and all are interested in seeing it a success.

It will be remembered that a year ago last August it was voted that the city of Ann Arbor bond itself for the sum of twenty-five thousand dollars for a contagious hospital. This sum of money was given outright to the University

quarantining of students not only was ineffective but meant great loss to the students and the University. The University Hospital at times has suffered a great deal from different contagious epidemics which on a number of occasions has led to the quarantining for months of certain portions of the Hospital. These quarantines not only meant a great pecuniary loss to the Hospital but greatly interfered with the clinical teaching.

Again, the University was anxious for a contagious hospital in order that it might be utilized for demonstrating contagious diseases to the senior medical students. Owing to the remarkable development and growth of the University Hospital during the past ten years, the members of the clinical faculty have had at their disposal a wealth of material for teaching purposes except in this one particular. Again and again has the faculty pointed out to the Uni-



Fig. 1. University of Michigan Contagious Hospital.

with the understanding that in return the latter was to furnish the land for the building, purchase the equipment and maintain the hospital. The city was to be charged the usual hospital rates for room, board and nursing of contagious patients, while medical attendance was to be free.

For many years both the city and the University have been in great need of a contagious hospital. The former has found it a very expensive proposition to care for its contagious patients, since it was obliged to pay the maximum price for medical attendance and nursing in this class of patients. House quarantines have been difficult to maintain and on the whole unsatisfactory, with the result that the city in the past has suffered from not a few contagious disease epidemics.

The University has been in even a worse condition as regards contagious disease. House

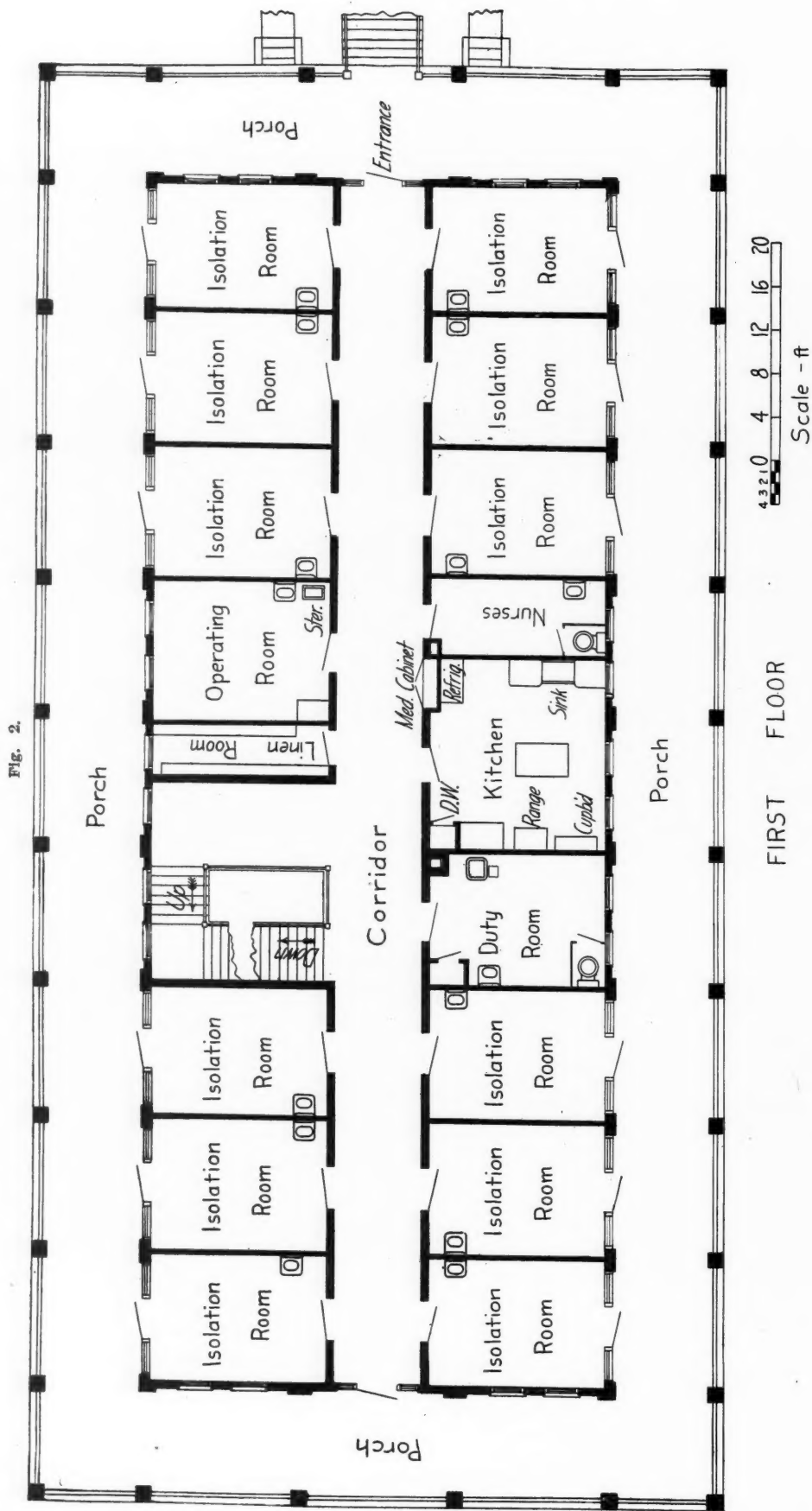
versity authorities the need of the proper facilities for the teaching of contagious disease, so that the University was ready for the hospital and willing to meet the city half way in order that both might be benefitted.

In order to meet the needs of both city and University the following had to be provided for:

1. The building or buildings must be so constructed as to accommodate patients with all varieties of contagious diseases.
2. The hospital must be so planned as to allow of the utilization of the patients for teaching purposes.

I distinctly remember the first plans submitted without solicitation to Dr. Hewlett and myself. These plans provided for three separate hospital units for patients with three separate contagious diseases. Each unit had its own administration and utility rooms and each opened by a separate corridor into a spacious amphi-





theater, where the patient was to be demonstrated to a class of students seated behind a glass partition. In these early days of the consideration of our problem this plan seemed a gem. There was only one hitch. The estimated cost of the hospital was from seventy-five to one hundred thousand dollars, three or four times the sum at our disposal. After discussing a scheme of asking the Regents for fifty thousand dollars to supplement the twenty-five thousand gift from the city and for obvious reasons giving up this

pretty well agreed that infection was not air-borne but was transmitted from one person to another by actual contact. By this is meant the virus producing the contagious disease is in reality deposited upon or within the person, who through this means contracts the contagious disease. From this it follows that if such conveyance from one person to another could be prevented by the proper technic, cross infection would not take place in a contagious hospital, even if patients with different contagious diseases



Fig. 3. View of porch on west side of building looking south.

plan as impracticable, it was decided to let the matter rest until after your medical director's visit to the east where he was to look into the contagious disease question, as applied to our problem.

I will not weary you with a detailed description of my trip and the many contagious hospitals I visited, but will endeavor to give you the results of this study. I found that the experts in the hospital care of contagious diseases were

were in the same building or even in the same room.

Nearly all of the experts referred to the pioneer work of Grancher who showed that infection is not air-borne but is from contact. They cited the examples of the French and English hospitals in the care of contagious diseases. In the Pasteur hospital in Paris the patients are kept in small cubicles in the same room and although the same nurses care for patients

suffering from different contagious disease, cross infection has been reduced to a minimum by taking precautions to sterilize everything which has come in contact with the patient.

While, as I have said, nearly all the experts were in accord that infection arose chiefly from contact, most of them did not have the courage of their convictions. In the same hospital you would see the patients cared for in accordance with the theory that infection was conveyed by contact but also that it was air-borne as well. Unconsciously they were unable to rid themselves of the old ideas regarding infection, as

up but it required many years of actual experience before surgeons became convinced once and for all that the air of the operating room had nothing whatever to do with surgical infection. The latter results from actual contact so that if the surgeon be sure that everything coming in contact with the wound is sterile, he is practically certain no wound infection will result.

Thus the theory of infection by contact as regards the contagious diseases appealed to me in two ways: First, it was in accord with my surgical experience and looked reasonable; sec-



Fig. 4. Photograph of an isolation room looking toward the central corridor.

shown by elaborate arrangements by means of adjustable partitions for preventing the air of one room from mingling with that of another.

Now this hesitancy to accept *in toto* or at least to put in practice the principles of the theory that infection is carried by contact was very familiar to me because of my experience in surgery. My hospital experience dates back to the time when the disinfection of the air of the operating room was still practiced. As an intern it was part of my duties to see that the carbolic vaporizer was thoroughly used the day preceding the operation. This was soon given

ond, if cross infection of contagious diseases could be reduced to a minimum by a system of medical asepsis, our problem here at the University Hospital was practically solved, since it meant that all kinds of contagious diseases could be treated in the same building. For one thing was certain: For the sum at our disposal, twenty-five thousand dollars, it was out of the question to erect a separate building for each contagious disease with all the duplication of administration rooms such separate buildings would entail.

Finally, in the course of my investigations I



reached the Providence City Hospital where I was overjoyed to find in actual operation, in accordance with the principles of the infection by contact theory, a pavilion which, with some changes, could be utilized for our purposes. The Providence City Hospital is a municipal hospital for the care of contagious diseases. The buildings have been designed under the supervision of Dr. Charles C. Chapin, Superintendent of Health of Providence. Doctor Chapin has been a health officer for thirty years and is an exceedingly competent man. He is a firm believer in the theory of infection by contact, as may be seen by a perusal of his valuable book,

the pavilion referred to is conducted but he has been of the greatest practical help to us in the drawing up of the plans of our contagious hospital.

The pavilion referred to is known as the Isolation Building, in which are placed doubtful or mixed cases of scarlet fever, diphtheria, chicken pox, whooping cough, rubella, mumps, measles and miscellaneous cases of infectious disease. The technic of this building is based upon the principles of aseptic nursing. The infection is confined to the rooms occupied by the patients, while the utility rooms and the central corridors are considered to be as free from



Fig. 5. Photograph of an isolation room looking toward the porch.

"The Source and Modes of Infection." A recent article of his in the February 7th number of the *Journal of the American Medical Association* entitled, "The Air as a Vehicle of Infection" is of especial interest in connection with our subject.

Dr. L. R. Richardson, the superintendent of the hospital, is also a very able man and is courtesy itself when it comes to placing at the disposal of medical visitors the results of medical asepsis in the treatment of contagious diseases. Not only did he spend a great deal of time with me explaining the system under which

contagion as are those of any general hospital. The same nurses, observing aseptic precautions, care for all patients. The interesting fact in connection with this building is that the technic employed has been proved to be eminently satisfactory, since only a very small percentage of cross infection has occurred among the large number of patients treated in this building. Since it is proposed to adopt practically the same technic in our own hospital as that in use at the Providence City Hospital, the details will be omitted until our hospital plan has been discussed.

As you are aware, our contagious pavilion is situated to the east and slightly north of the Psychopathic Hospital. This site was selected by the Board of Regents for the following reasons:

1. It was the best site available in that it provided for a maximum amount of fresh air and sunlight, both of which are highly desirable in the treatment of contagious diseases.

2. It was near enough to the general hospital and its power plant to provide for tunnel connections at a minimum cost. At the outset it was realized that separate kitchen, heating and lighting plants for the new hospital would be very expensive, so far as maintenance is concerned. As soon as possible it is proposed to connect the building with the main hospital by a tunnel not only large enough to convey steam and electric light mains, but also to allow of traffic. In this way it will be perfectly possible to convey food to the pavilion from the main kitchen, besides providing a protected passage-way from the main hospital for nurses, doctors, students and employees. Such a tunnel is absolutely necessary if the pavilion is to be utilized to the greatest advantage.

The building itself has been designed by Mr. J. H. Marks, Superintendent of the university buildings and grounds department in accordance with the suggestions submitted by the members of the medical faculty and your medical director. (Fig. 1). The provisional plans were sent to six or eight well known experts in contagious diseases with a request for suggestions and criticisms. In fact every effort has been made to make the building in every way practical and useful. Undoubtedly mistakes have been made, for no hospital is ever perfect, but at least those designing the building have known what they wanted and have considered each point in detail.

From the outset it was felt that the hospital should accommodate at least twenty-four patients. This capacity has been kept constantly in mind and when it was seen that the cost of the building was going to exceed twenty-five thousand, a cut was made in the construction, rather than in the number of hospital beds. Many things have been omitted which would have gone in had a larger sum of money been available. But the orders of the Board of Regents were not to expend a dollar beyond the sum received from the city. During the planning and construction of the hospital this seemed rather a hard ruling but after all perhaps it is just as well for as a result it shows how much can be done in hospital construction for twenty-five thousand dollars.

The hospital runs north and south, is of the bungalow type and is of semi-fire proof construction. It is 103 feet long and 40 feet wide exclusive of a ten foot porch surrounding the

entire building and on a level with the first floor. All bearings are of brick or concrete and all bearing members other than these are of steel. The roof construction is not fire proof which, considering the many points of egress from the building, does not seem necessary from a personal hazard standpoint. The heating plant is designed for steam to be furnished eventually from the central plant through a tunnel which will also serve as a passage-way to the building from the general hospital. The electric lighting is of the old direct type though the wiring is adequate for the indirect system in case this be decided later to be desirable. No expense has been spared on the plumbing, the materials and fixtures of which are the best obtainable. The concrete and plumbing work was done by contract, the electric wiring and painting being done by the University. From the standpoint of construction the building is very satisfactory, all workmanship being first class.

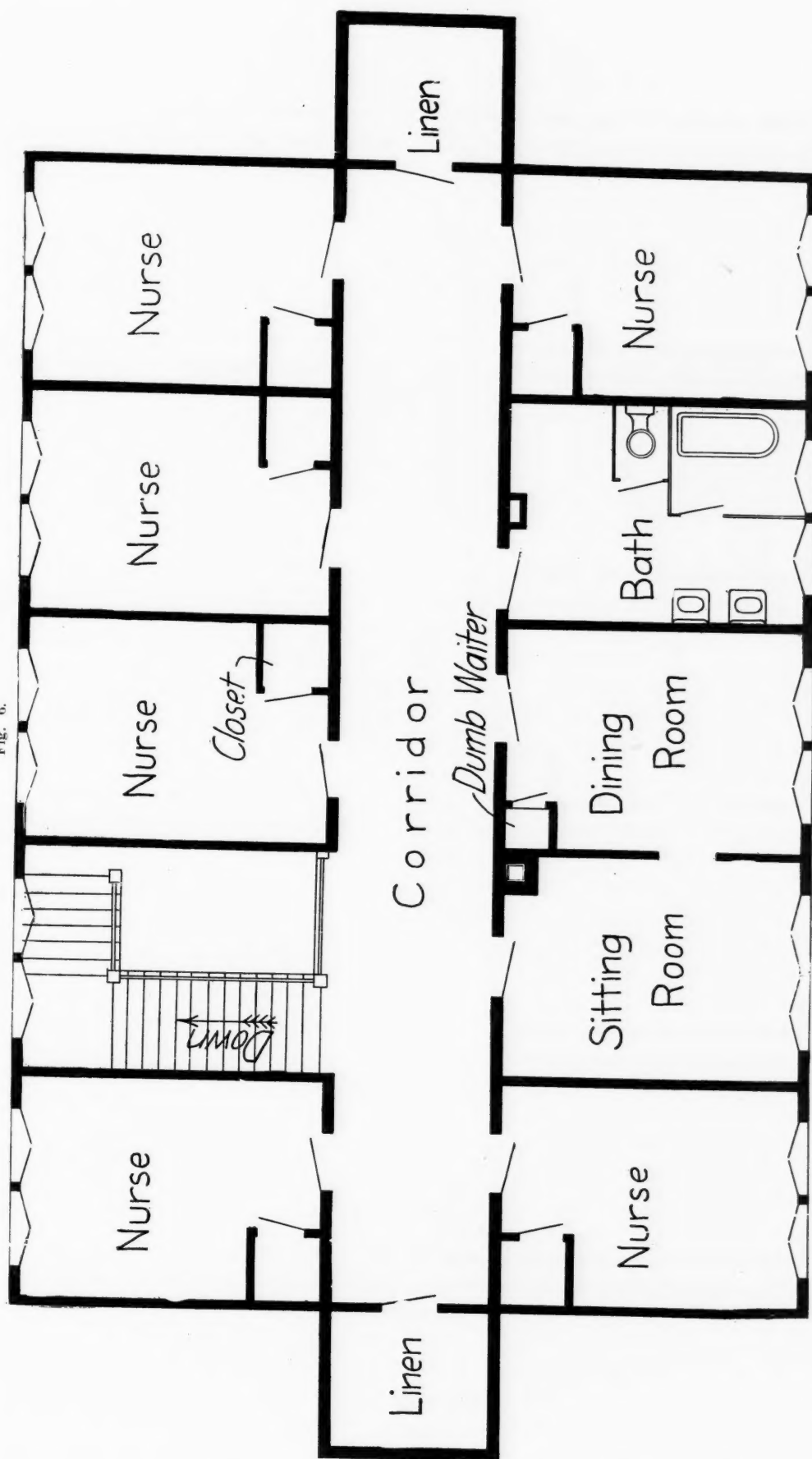
The first floor (Fig. 2) is entirely given over to patients and service rooms. The latter, consisting of utility, bath and operating rooms are situated in the center and are therefore readily accessible to the patients' rooms which are located at either end of the building. These twelve rooms are of the same size, 12 by 16 feet, and each can easily accommodate two persons.

Each room opens upon the ten foot porch by means of a door wide enough for the passage of an ordinary hospital bed. (Figs. 3 and 5). On each side of this door are windows over which are situated transoms. The upper half of the door, opening upon the central corridor, is also of glass. The result is an abundance of light for each room in spite of the covered porch.

Each room is furnished with a lavatory where the hot and cold water is regulated by a knee pressure device. The furniture of the rooms is to be of the simplest. It will consist of two iron beds, two bed side stands, two enameled chairs, shelf for towels, soap retainer worked by foot pedal, brackets for wash basins holding solution, two small shelves for toilet articles, and wall hooks for nurses' gowns. (Figs. 4 and 5).

In order to avoid a common error of hospital construction, the utility room and diet kitchen have been made especially large. The operating room is also of good size. The linen closet, situated in the center of the building next to the hallway is plenty large enough for the supplies of twenty-four patients. The bath room was intentionally made small since the common use of such a room was impossible with men and women patients on one floor. Even with two bath rooms patients with different contagious diseases could hardly use the same toilets without great danger of infection. When bedside bathing is necessary it will be done by means

Fig. 6.



SECOND FLOOR



of a portable bath tub which will be emptied and sterilized after each use.

In the summer the entire porch will be screened. This will permit of the free opening of the doors and windows leading to the porch and insure plenty of fresh air.

The second floor has been arranged to accommodate twelve nurses. (Fig. 6). Besides the six bedrooms, each of sufficient size for two nurses, there is a dining room, a comfortable sitting room and adequate toilet facilities.

The entire basement with the exception of the morgue and laboratory has been given over to sterilization purposes. (Fig. 7). On the east side of the central corridor will be installed a most complete hospital fumigating and sterilization plant. Here will be disinfected the mattresses and the laundry before it is taken to the main hospital laundry. In the same apparatus articles impossible of sterilization by high pressure steam can be disinfected by formaldehyde vapor. Leading from this sterilizing plant will be a storage room for disinfected mattresses. The rooms across the hall have been arranged into infected and uncontaminated rooms for doctors, nurses, students and employees. The clean rooms will be plentifully supplied with steel lockers in which can be placed the street clothing of those entering the hospital. All these rooms have abundant lavatory facilities, so that all infectious material can be removed before the workers don their street clothing.

On the same side with these rooms is a patients' dismissal room equipped with a bath tub and lavatory, where the patient is thoroughly sterilized before entering the patients' locker room in which his disinfected clothing has been placed.

The floor of the porch has been made high enough and the grading so arranged as to allow of four-foot windows in the basement. These windows together with the white painted walls furnish light in abundance.

The main hospital entrance is at the south end of the building. This entrance leads to the basement and the first floor. There is no elevator in the building, the different floors being connected by a wide central stairway. A large dumb-waiter runs from the tunnel entrance in the basement, through the diet kitchen on the first floor to the nurses' dining room on the second floor.

The success or failure of the hospital under its proposed plan of operation will depend largely upon how the nursing staff carries out the principles of medical asepsis. The nurses will be in charge of one of our own graduates, an excellent executive who has spent months in perfecting herself in the technic which has proved so satisfactory at the Providence City Hospital. Before the hospital is opened the nursing staff will be thoroughly drilled in the

principles of medical asepsis. Just as in the surgical operating room they will be taught that the conveyance of any infectious material to those free from disease may and probably will result in infection. They will be told that if they contract a contagious disease while on the contagious diseases service, it will be through their own or their associates' fault. Just as it is impossible for a well trained nurse to brush back her hair in the operating room or touch articles not surgically clean, so it will become impossible for the nurse drilled in medical asepsis, who has cared for a contagious patient, to touch anything until her hands have been thoroughly sterilized.

The nurse on entering the room to care for her patient will put on a gown, in order to avoid accidental contamination of her clothing. After attending to her patient she will remove her gown and thoroughly sterilize her hands and arms in running water and liquid soap, obtained from a retainer worked by a foot pedal so that the infected hands do not need to touch the receptacle. After immersing the hands and arms in some mild but effective antiseptic solution, the nurse can leave the room confident that she will not carry contagion to another patient. The main corridor is free from infection and is kept so.

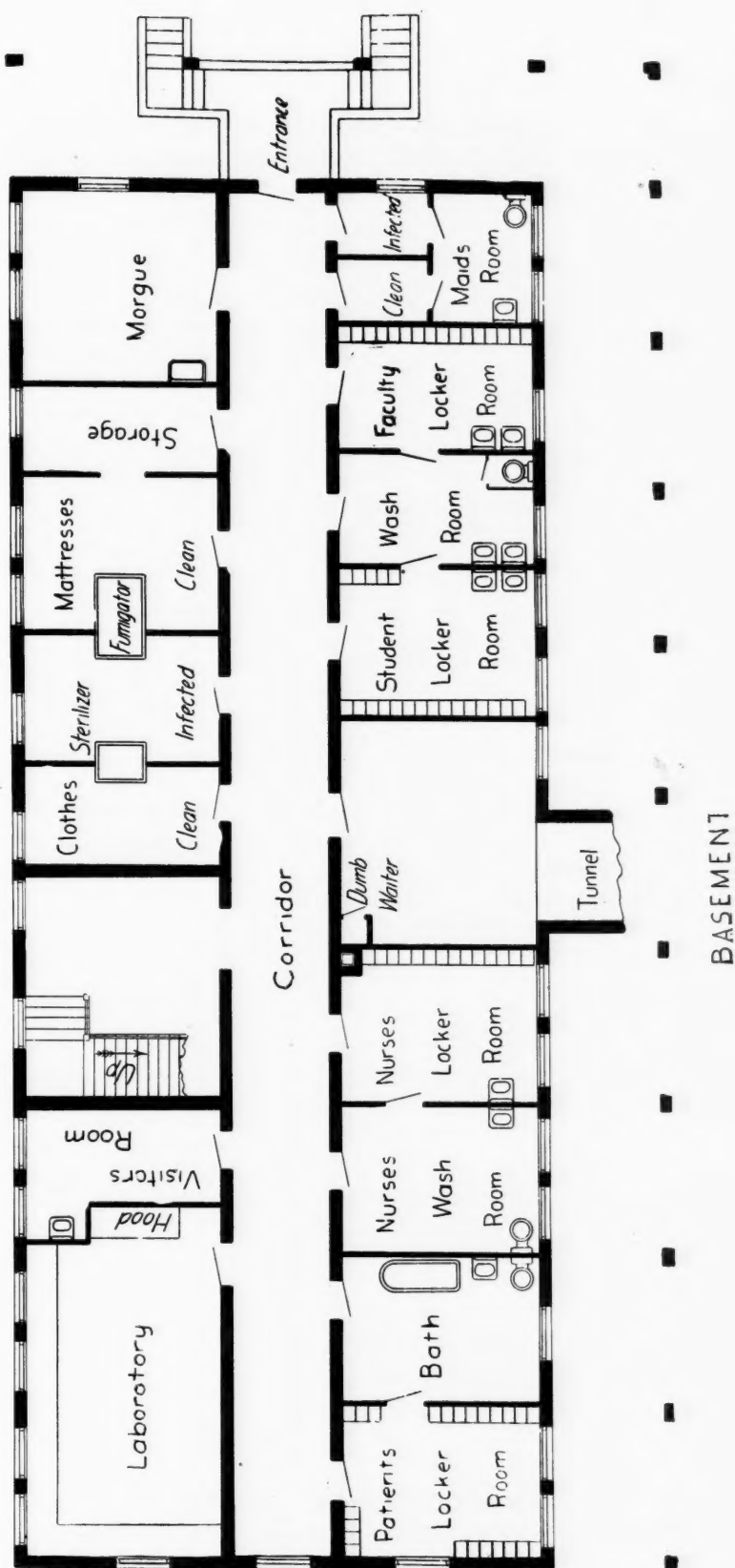
All dishes and other utensils used in the patients' rooms are immediately sterilized by steam or strong carbolic solutions. Patients' night clothing and bedding are placed in canvas receptacles and carried to the fumigating plant where they are sterilized, receptacles and all.

Extra precautions will be required of the nurses before they leave the building or retire to their rooms. In order to avoid a great danger of infection they will be prohibited from eating while on the wards. They will be served in their own dining room on dishes which have been boiled and with food that has not come in contact with any contagion. Because of a possibility of a slip in the technic and the acquiring of a contagious disease, illness of any kind among the nurses on duty will be carefully observed and if necessary the nurse will be isolated for observation.

The contagious service will not be made compulsory for any pupil nurse but, if history repeats itself, when the pupil nurse feels that if she carefully carries out a certain technic, there is very slight danger of contracting a contagious disease, she will be loath to forego such valuable experience.

One of the most valuable features of the hospital is the porch which can be made serviceable in many ways. Since each room opens upon the porch by a door through which a bed can be wheeled each patient is assured at all times of abundant open air treatment. Such a porch does away with the necessity of a pa-

Fig. 7.



tients' receiving and examining room, since each patient can be admitted directly to his room by way of this porch. Care will have to be exercised to keep porch patients with different contagious diseases from infecting each other. However, this can be prevented by means of movable screens which can serve as barriers.

It is felt that from a teaching standpoint the building will be particularly serviceable. It is proposed to demonstrate the contagious dis-

be thoroughly drilled in the principles of medical asepsis, so that he neither will convey infection from one patient to another nor contract it himself.

The student will be gowned when he enters the patient's room for fear of accidental contamination. Otherwise, unless he handles or touches the patient, a gown would be unnecessary. After the patient has been visited the gown is removed and the hands and arms carefully washed. The street clothing is then re-



Fig. 8. Photograph of central corridor, first floor. Although the patients' rooms open upon this central corridor, the latter will be as free from infection as those in a general hospital.

ease patients to the students in sections. It certainly seems ridiculous to demonstrate such diseases to students behind glass partitions for fear of infection during June of the senior year and then expect such students to care for patients with similar diseases July 1st, after the students have graduated and entered upon their practice. Just as the student, drilled in surgical asepsis, is taught how to wash his hands and refrain from touching anything surgically unclean during an operation, he will

sumed and the student can leave the building without fear of carrying contagion with him.

The porch will be found especially serviceable when a single patient or a series of patients must be shown to the whole class in too short a time to allow of section demonstration. By means of the porch and the glass doors and windows of each room such patients can easily be demonstrated to a class of a hundred or more students in a very short time.

When a room is emptied it will not be dis-



infected by fumigation. No part of the Isolation Building at Providence has ever been fumigated and the good results speak for themselves. If there be nothing to the theory that infection is air-borne, then the air of the room in which the contagious patient has been is as free from organisms as is that of any other room. To make the room free from the possibility of infecting another patient who may occupy it, the bedding, the mattresses, the bed, the walls as far as the patient can reach, in fact, everything which the patient could have touched must be disinfected. It has been shown that this can be very thoroughly done by scrubbing with soap and water. The room should be well aired before it is occupied, just as we would thoroughly air a room recently occupied by a patient with a non-contagious disease.

Let me say in conclusion that there will be cross infection under any system of the hospital care of contagious patients. There is cross infection when a separate hospital unit is employed for each contagious disease. Undoubtedly there will be some cross infection under the plan proposed, but it will be very slight provided those having to do with the hospital are careful as regards the technic. It is in your hands to demonstrate how in a teaching hospital a contagious pavilion with all kinds of contagious patients can be conducted with a minimum amount of cross infection.

#### DISCUSSION.

DR. HOWARD H. CUMMINGS: The new contagious hospital will be of great value to the senior medical students and will aid greatly in the work of the University Health Service. As many of you know, the Regents have provided a way whereby students, ill and needing hospital care, can be sent to the hospital and remain for sixty days if necessary. During this year we have had cases of measles, mumps, chicken-pox, whooping cough, diphtheria, Vincent's angina, tuberculosis and pneumonia. In the last two weeks, we have treated forty cases of epidemic sore throat. All of these patients could have been cared for in this hospital.

DR. JOHN A. WESSINGER (Health Officer): The matter will be governed by first come, first served. There may be a time when there are twenty-four patients in the hospital, all students, and when there is no room for city patients. We can't help that. First come, first-served. And there may be a time when the hospital is full of city patients and there is no room for students. In my opinion it will be some time before all rooms in the contagious hospital are filled at one time, and when that time comes, it will be time enough to make preparations for another building, or rather an addition to the present building.

DR. PETERSON (closing the discussion): The University authorities will soon submit to the city the scale of charges for patients treated in the contagious hospital. It goes without saying that these charges will be made as reasonable as possible, since the University is not trying to make money out of any portion of its Hospital. It must be remembered that on account of extra laundry and other things

needed in the care of contagious patients the cost of maintenance of this class of patients is higher than with the ordinary hospital patients. I am sure all patients, whether they be university students, city charges, or citizens of Ann Arbor, will be treated alike and that the administrative policy of this new pavilion will be satisfactory to all concerned.

#### SOME POINTS OF INTEREST IN INGUINAL AND FEMORAL HERNIA.

CYRENUS G. DARLING, M.D.

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There are many theories concerning the formation of hernias and nearly all, more or less, contain a bit of truth. Andrews believes that a well developed abdomen rarely fails in its function of retaining its contents perfectly and it is strange that the strains put upon the abdominal wall should not more frequently cause a giving way of the wall. He believes that congenital defects and injuries are the cause of nearly all abdominal hernias.

Dr. Ochsner in a recent article on hernia in children holds to the theory of inside pressure and advances many good reasons in support of his belief. He admits, however, that a faulty development of the abdominal wall and an unclosed tunica vaginalis may be to some extent the result of inheritance. On the other hand Bernstein says the theory that intraabdominal pressure causes the hernia is probably overthrown today. Roser thinks that the sac is primary and the contents secondary.

Bernstein calls attention to the presence of depressions in the peritoneum, which he calls hernial anlage as being of great importance in the formation of hernias. He found that in a large number of bodies examined that 25.8 per cent. had a hernia or hernial anlage.

Linhart advances the theory that femoral hernia is frequently caused by lipomata advancing through the ring and pulling the peritoneum with it to form the sac.

Many other theories might be mentioned, but with the above in mind, during the last few months I have examined patients during the operation for the following:

First, for the presence of hernial anlage in the inguinal or femoral regions.

Second, the presence of lipomata preceding or associated with the hernial sac.

Third, any abnormal or unusual conditions associated with operations for the cure of hernia.

In median line operations when one has the hand in the abdomen depressions in the peritoneum can be easily detected at the site of the femoral or the inguinal openings or in both at the same time. I always make a point of examining the right side when operating for chronic appendicitis and in one instance this

habit was of value. This was in the case of a young man with a vague history of sudden and short attacks of appendicitis. I readily found the inguinal depression and passed my index finger into the canal. The tissues seemed to grasp my finger and suggested what might happen to an inclosed piece of bowel. Was not this patient suffering from repeated attacks of hernia instead of appendicitis? I removed both sac and appendix and did not experiment for an answer.

The results of these examinations coincide with those of Bernstein as about one in four contained one depression and in one case, four were found.

A young man twenty-one years old, a night watchman, while running, fell forward striking his right inguinal canal against a hard substance. There was some soreness, but not enough to interfere with lifting heavy bags the next day and the day following. Two days after the fall he noticed a swelling in the right side, not painful, but unusual. He went to see his physician about it and he diagnosed a hernia. It was irreducible and remained this way for about three weeks when one morning he found that it had suddenly disappeared. He reported this fact to his physician, who advised him to go at once to the University Hospital for operation.

At the Hospital he was asked as usual to produce his hernia, but to no effect. Curiosity and the desire to do the man some good, led me to operate in the absence of a hernial tumor. Nothing unusual was found until the inguinal canal was opened. Near the lower end of the canal in close relation with the cord was what appeared to be a hernial sac. When this was opened about thirty drops of clear fluid escaped. This was a cyst without an opening, but there was a prolongation of tissue, such as composed its wall, back through the internal ring. When this prolongation of tissue was opened, a small canal was found through which a grooved director could be passed into the abdominal cavity. The bruising of the lower end of this canal formed a cyst, which under sufficient pressure, could empty along the canal into the abdomen and showed conclusively that a very narrow sac from the peritoneal cavity was present, only requiring sufficient force from above to convert it into a hernia.

Another of a similar type was in a man of forty-five years old, with what appeared to be a right femoral hernia, which could be reduced by firm continuous pressure. After the skin incision, the fat was carefully separated from the sac so that it was entirely exposed. The sac was then opened and about two drams of clear fluid removed. Examination of the interior of the sac disclosed a small opening through which a grooved director could be

passed into the peritoneal cavity. This opening had a valve action, which allowed the fluid to flow freely from the abdominal cavity to the sac, but did not permit it to return.

It would seem that in some instances hydrocele of the cord might be formed in the same manner, especially in cases of congenital hernia, or even in cases that appeared some time after birth where the hernia had been reduced and a truss worn for some time. This case also presented the mass of subperitoneal fat, which is supposed to be carried down in front of the peritoneum.

Another case was that of a student, twenty-three years old, operated under local anesthesia for right femoral hernia. There was a large amount of fat in the space below the femoral ring in which the sac was buried. As the opening was very large, some of the fat, together with the stump of the sac, was inverted to plug the opening. The tissues were separated from the femoral vein for the purpose of exposing it so that it might not be injured by the suture and also for the purpose of securing a firm fascia, which when sutured to that on the opposite side of the opening would effectually and firmly hold the tissues in the canal.

In some of these cases of femoral hernia, the mass of fat was large enough to be called a tumor. In two cases it seemed like an independent tumor but careful dissection revealed within the remains of a sac. It would seem that in some instances the small elongated sac had never contained any thing but fluid. Yet they must be considered as possibilities for the development of hernia if proper pressure is exerted from within.

I recently saw a case of strangulated femoral hernia in Professor de Nancrede's clinic, which presented some interesting points. The patient was a syphilitic, and very anemic with 35 per cent. hemoglobin. The hernia had been strangulated but a short time and no attempt had been made at reduction: The fat which surrounded the sac was quite edematous and the lymphatic nodes around the femoral opening showed the usual enlargement found in the secondary stage of syphilis. The edema was probably caused by the interrupted circulation and the anemia. There was no discoloration of the tissues.

In another case operated at the University Hospital, I followed the advice of Dressman, opening the sac close to the internal ring. On the posterior and outer side of the sac was a depression or diverticulum back of the neck of the sac, such as is found inside of the abdomen. It was about one-half inch deep. Though the hernia had no particular relation to this depression, it may have started in another depression lower down.

Can hernia be cured by wearing a well adjusted truss? I operated upon a case where a truss had been worn for some time. When the inguinal canal was opened, the patient vomited, but nothing came down into the sac. This gave a fine exhibition of the way the transversalis and internal oblique muscles can hold the abdominal contents back when they are both impaired and the ring not expanded. This seemed like a so-called cure through wearing a truss, but the sac was readily found on the inner side of the cord. When opened, a very narrow neck was found not large enough to let the intestine through in its present condition. The other side was reported to have shown a hernia at one time and there was some difficulty experienced in producing a sac. When it was found there were two small cysts at the lower end definitely separated from the sac either of which might have increased in size if injured. A truss had never been worn on this side and the patient had no knowledge of the injury. I cannot explain the origin of these cysts.

A young Italian laborer, very muscular, was thrown forward. In the attempt to save himself from falling an inguinal hernia was produced. The hernia was immediately reduced and a truss applied but he was unable to wear it. He was operated for the hernia on the sixth day after the accident. The external oblique fascia was unusually firm and strong. The conjoined tendon was a real tendon and all the tissues seemed perfect. The sac extended down into the scrotum and was exceedingly thin. There was a well defined neck to this sac, which was red, infiltrated with some plastic exudate on the peritoneal side. There was no difficulty in reducing the hernia when the truss was applied. Was this a preformed sac, which was injured when the hernia was formed or was the change in the tissues due to injury from the truss which was in position but a few hours?

There is nothing new in my recorded observations of these cases, but like many instances in research, they may help to confirm or destroy the theory of some other investigator. The evidence is strong in favor of the preformed sac, in part at least, in most cases of inguinal and femoral hernia.

Linhard's theory, that muscular action first moulds a piece of fat through the femoral ring, which in turn pulls down the peritoneum thus forming a sac, may not be entirely true, but in a large number of cases the fat is there and in some instances the amount is large enough to be called a tumor.

A truss never cures hernia and except for temporary use should be abolished.

My most important point can be mentioned only for discussion. If hernia is a congenital deformity or is acquired through no fault of

the owner then the State should extend to him the privilege of an operation without expense, provided he is not able to pay for same.

#### DISCUSSION.

DR. REUBEN PETERSON: As a contribution to the subject discussed by Dr. Darling, I wish to cite my findings in several hundred cases of shortening the round ligaments after opening the inguinal canals. I cannot give my statistics off hand, but in quite a few cases hernial sacs were found where the opening into the peritoneal cavity was so small as to preclude the passage of any bowel through the internal ring. In a number of instances the sacs were cystic and the condition undoubtedly congenital.

DR. R. A. MCGARRY: In regard to the cause of hernia I would like to suggest that as a predisposing factor, embryonic development may play some part in it. An over development, or excessive amount of peritoneum, should be considered. In cadavers we often find conditions suggesting this, as an exceptionally long common mesentery, or long mesocolon.

#### REPORT OF CASE OF DERMOID CYST OF THE ORBIT, PRODUCING MARKED EXOPHTHALMOS, RELIEVED BY THE KRONLEIN OPERATION.

WALTER R. PARKER, M.D.

Professor of Ophthalmology, University of Michigan.  
(From the Ophthalmic Clinic, University Hospital, Ann Arbor, Michigan.)

*History.*—The patient, Mrs. S., aged 30, came to the clinic January 21, 1914, complaining of prominence of the left eye. The family and personal history were negative. The left eye was noticed to be larger than the right about twenty years ago, but there was not much change until six years ago, when the exophthalmos rapidly became more marked till in a few months it assumed the present condition. About five years ago there was some pain in the eye and a progressive failure of vision began.

*Examination.*—Vision right eye,  $5/4$ , left eye faint light perception. The pupillary reflexes were present. Tension, right eye, 20 millimeters Hg., left eye, 4 millimeters Hg. The right eye showed no external pathology. The left eye showed marked proptosis, measurement with the exophthalmometer reading, right eye 12, left eye 35. The anterior pole of the cornea was one-half inch below the level of a corresponding point of the right eye, and was nearly on the level with the bridge of the nose. The eyeball while not enlarged was nearly all anterior to the boundaries of the orbit which was filled with a somewhat slightly movable mass. Indefinite pulsation was detected above and there was indistinct fluctuation temporarily. The insertion of the external rectus was fairly well marked and its action could be plainly seen. The movements of the eye were limited in all directions, especially in abduction.



The lids were enlarged but freely movable. The upper lid at rest completely covered the cornea leaving an elongated aperture of about one quarter inch between the upper and lower lid borders.

The palpebral and ocular conjunctiva were only slightly congested. The fornix was occupied by loose vascular tissue showing distinct venous engorgement, and above were large venous plexuses. The cornea, iris and anterior chamber were practically normal.

*Ophthalmoscopic Examination.*—The right eye showed a few vitreous opacities but was otherwise normal. The left eye showed a distinct

Wassermann test reported positive by one test, negative by another.

*Otolaryngologic Report.*—Very large middle tubinate on left side. There were no signs of tumor in the nose. Transillumination shows nothing on account of tumor.

*Diagnosis.*—The slow growth of the tumor, absence of fluctuation, compressability, and pulsation, together with the normal sinuses as shown by the otolaryngologic and X-Ray reports lead to the diagnosis of benign tumor situated entirely within the orbit—the exact nature of which not determined. (Figs. 1 and 2.



Fig. 1. Case of Dermoid Cyst of the Orbit before Operation.

secondary optic atrophy, with a pale avascular nerve head. The retinal vessels showed some tortuosity. There was a large area showing choroidal changes situated above the disc and a peculiar striated arrangements of pigment extending down and around the macula.

Blood and urinary examinations were negative.

*X-Ray Report.*—Maxillary and frontal sinuses open, unusually large size. On the left side, the orbit is filled with a relatively dense mass, causing a distinct depression of the lower floor and apparent elevation of the roof. Sphenoid cell is not involved. Some opacity in the neighborhood of the ethmoids. Sella turcica normal.

*Operation.*—A wide skin incision about three inches long, semicircular in shape, convexity forward, was made temporarily. A Krönlein resection of the outer wall of the orbit was done, a portion of the malar bone removed. The periosteum was dissected free from the outer orbital wall at its margin. The tumor mass was accidentally ruptured with the escape of a large amount of brown serous fluid causing a marked recession of the eyeball. By blunt dissection the whole of the cyst sac was easily freed from the periorbital and the muscle cone, except near the apex where it was more firmly adherent to the periosteum. The deeper contents of the sac consisted of a brownish liquid, and thin pultaceous material containing fragments

of hair. There was practically no orbital fat, and after the cyst was removed an unobstructed view could be had to the apex of the orbit. The wound was closed with silkworm and horse-hair sutures without drainage. The eyelids were united by a single suture.

*Postoperative History.*—The postoperative recovery was uneventful except for some edema of the lids and conjunctiva which was controlled by pressure bandage. The proptosis was reduced from the first. When the stitches were removed about one-half dram of straw colored fluid escaped from the incision near the outer canthus but no infection nor reaccumulation of fluid resulted.

an exceedingly rare occurrence. The commonest position is near the upper and outer angle of the orbit overlying the frontomalar or the frontotemporal suture. They are frequently found at the upper and inner angle of the orbit overlying the frontoethmoidal suture. When found lying at some depth in the orbit, they are external to the muscle cone, and closely connected with the muscles, the eyeball, the sheath of the optic nerve, or the periosteum. Although situated deep in the orbit they may have their origin at the orbital margin. Their contents are well known to consist of epithelial debris, sebaceous material and hairs. In rare cases a tooth has been found.

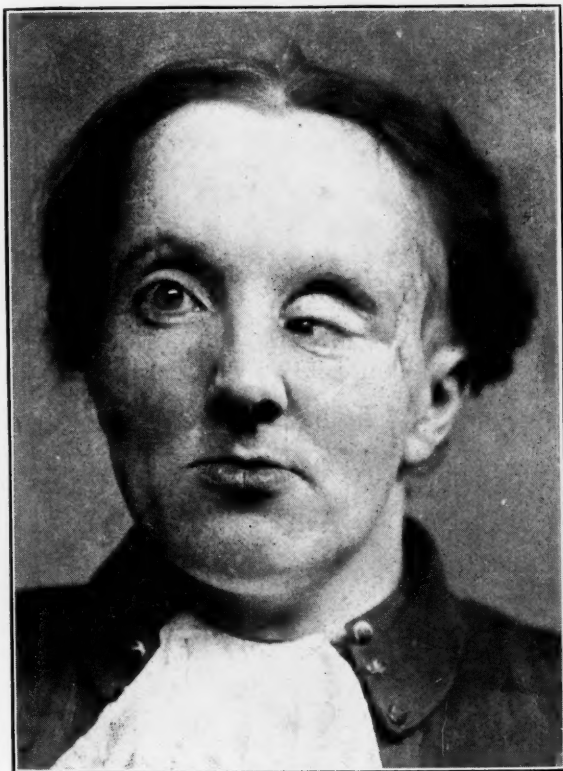


Fig. II. Case of Dermoid Cyst of the Orbit after Operation.

The last examination shows ptosis from lack of cushion and eyeball markedly convergent and displaced down about 11 millimeters. The eyeball can be rotated just beyond the medium line. The eyeball is normal in appearance. (Fig. 3).

*Pathologic Report.*—Old dermoid into which there has been a hemorrhage. Destruction of the epidermis, with but a few dead hairs remaining in the wall. Much cholesterol.

Dermoid cysts are always congenital. They are regarded as fetal structures resulting from the invagination or involution of the external blastodermic membrane. They are by no means rare in the conjunctiva or at the orbital margin, but to find one in the orbit leading to an exophthalmos as in the case here reported is

As a rule, on account of their superficial situation, they do not displace the eyeball, but push forward the skin of the lid through which they can be readily felt as round movable tumors. When they are situated deep in the orbit the diagnosis becomes more difficult; especially is this the case if the cyst wall has become so tense as to make the pressure or absence of fluctuation indefinite. The history of the case will at once eliminate the possibility of a malignant tumor. Meningocele and encephalocele are two congenital conditions which must be eliminated as possibilities before operating. The first is a prolapse or hernia of the meninges with cerebrospinal fluid contents, projecting through a breach in the retaining skull wall. The second is the same with the addition of

brain substance prolapsing within the meningeal sac. Both are reducible and after reduction the bony margins of the aperture through which they came can be felt. Pulsation and hemic sounds can be elicited. The size and tension is variable. A dermoid cyst will present none of these phenomena. If the cystic nature of the tumor can be established, without pulsation, a mucocele having its origin

in one of the accessory sinuses must be considered as a possibility.

When the cysts are superficial, they can usually be extirpated without difficulty. But when the process extends deep into the orbit complete removal may be difficult. If the whole cyst is in the orbit, as was the condition in the case here reported, the best mode of procedure is a Krönlein's temporary resection of the external orbital wall. (Fig. 3).



# The Journal

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MAY.

### Editorials

#### THE CLASSIFICATION OF DIGESTIVE DISORDERS IN INFANCY.

The classification of purely digestive disorders in infancy, or, in more recent terms, difficult feeding cases, has had a somewhat interesting history. These are now and should be carefully distinguished from those digestive disturbances accompanied by acute disease elsewhere in the body. The conditions, however, may often be the result of a previous acute disease.

With the advent of cellular pathology, an attempt was made to classify these disorders on the basis of post-mortem tissue changes. *Gastritis, gastro-enteritis, colitis, ilio-colitis*, were terms contributed at this time. Valuable as have been the contributions of pathological anatomy in this regard, they still fail to offer us any usable clinical basis for diagnosis and treatment.

Later, the development of bacteriology promised to furnish the desired classification. The first edition of Keating's Encyclopedia of the Diseases of Children, for example, appeared about this time, and the chapter on intestinal disorders was written from the bacteriological point of view. The end of this work is not yet written, but we have the Shiga-Flexner bacillus of dysentery streptococcus, pyocyanous, and gas bacillus diarrheas. These cases are not common, however, and bacteriology does not offer at all a complete classification of digestive disorders.

To-day physiological chemistry and the study

of the metabolism of growth and of disease offer the most promising fields for investigation.

The study by the methods mentioned has also developed a certain number of infectious and local diseases, whose symptoms follow closely those of purely digestive disturbance, for example, pylorospasm. Other less closely related pathologic conditions must be recognized as frequent causes of gastro-intestinal symptoms. Among these may be mentioned tuberculosis, congenital syphilis and pyelitis.

There remains the great number of purely functional or nutritional disturbances in which clinicians have felt the greatest weakness in our system of classification. And since these cases form perhaps the largest single group in the general practice of pediatrics, this weakness has been a vital one.

American text-books have usually followed the anatomical nomenclature and classified the disturbances as, Gastric, Intestinal, or Gastro-intestinal, as the symptoms seemed more related to one or the other, or to be combined. This classification offered a convenient name for the symptoms, but practically nothing else. So far as treatment was concerned, such a diagnosis gave one almost no help.

Following the suggestion of Czerny and Keller in their work of "food injuries," Biedert suggested in 1899 that the logical method of classifying these cases was according to the food element which was not successfully digested and assimilated:

1. Fat disturbances.
2. Carbohydrate disturbances.
3. Proteid disturbances.

The offending food element was to be determined by the examination of the stool. This is possible because of the simple and limited diet of the infant. Knowing the characteristics of a normal stool on a certain diet, one can recognize the pathologic elements. To make a diagnosis of the difficulty on this basis one should have accurate knowledge of the composition of the food and then carefully examine the stools. Very important information may be obtained easily and quickly without the use of complicated or expensive apparatus, and there is no reason why every practitioner should not be able to make these observations.

This classification does offer real indications for treatment and diet, and within certain limitations is very useful clinically.

The latest classification to be offered is that of Finklestein. He maintains that our attention has been altogether too much localized on the alimentary canal as the seat of disease in these cases and that we have failed to recognize a real constitutional disorder in these disturbances of nutrition. He maintains further that there is practically no such thing as protein disturbance or intolerance. In addition to this,

he has worked out a food made from cow's milk, wherein the fat and sugar are low, and the soluble proteid is reinforced. This is known as *Eiweiss-milch*. Finklestein's classification is based on the degree which the malnutrition has reached as follows:

1. Weight disturbance.
2. Dyspepsia.
3. Decomposition.
4. Intoxication. (Cholera Infantum, *Enterokatarrh*.)

*Weight disturbance* indicates a beginning of nutritive disorder. *Dyspepsia* and *decomposition* represent respectively moderately and severe disorders. *Intoxication* represents the acute cases.

We have then a classification based on the anatomical distribution of symptoms, on the food element at fault, and on the stage and severity of the symptoms. The last two are especially useful and one will use both in reality, whatever terms he may apply to an individual case.

The use of some such classification and the making of an accurate diagnosis of the condition is an essential in the intelligent direction of these cases, and will be found of decided assistance in treatment.

HERBERT M. RICH.

## THE RADIO-ACTIVITY OF POTASSIUM.

The discovery of the X-Rays in 1895 by Roentgen spurred on the scientific world in the closing years of the last century to new conquests. In 1896, Prof. Henri Becquerel discovered in uranium a new property of matter—radio-activity—a study of which has revealed such remarkable and important results not only in the domain of physics but also in chemistry and medicine. During the year 1898 three new radio-active elements were discovered, *thorium*, *polonium* and *radium*, the latter two by the Curies. In 1899, another important active substance was added to the rapidly growing list of elements possessing the property of radiation; this was *actinium*. In 1907, N. R. Campbell discovered that potassium and rubidium possessed radio-activity. This activity of potassium is shown not only by the element itself, whether of mineral or of vegetable origin, but also by all its compounds, which fact puts it in the list of the radio-active substances. For instance, the possession of radio-activity by quinine sulphate does not place quinine on the list, because only the sulphate compound is active, and then only after a preliminary heating.

There is more than one peculiarity that distinguishes potassium from the majority of the radio-active elements. In the first place, potassium emits only *beta*-rays. These are high

speed rays, and are individually equal in penetrating power to the swift *beta*-rays of uranium, but collectively their activity is about 1/1000th that of an equal amount of that element. Of course, uranium does not itself emit any *beta*-rays, but its product, uranium, does. It may be of interest to note that the *beta* particle of rubidium has only one tenth the penetrating power of that of potassium. Again, the ordinary radio-active substances have a heavy atomic weight; for instance, uranium has an atomic weight of 238, thorium 232, radium 226; but, on the other hand, potassium (39) and rubidium (85) are the only elements of light weight that with certainty are known to possess radio-active phenomena. There appears no explanation why, among all the light elements, potassium and rubidium alone should exhibit the property of the expulsion of high-speed particles. From analogy it would seem probable that these two elements are undergoing an atomic disintegration and transformation at a slow rate with the emission of *beta* particles.

The above facts are essentially all that is known of importance about potassium up to the present time.

The writer would like to theorize on the therapeutic application of this newly discovered activity of potassium and its compounds. But first of all I would like to call the attention of the reader to the attempts that are now being made to introduce into the body and blood-streams the radio-active products of uranium and thorium. This is being accomplished, more or less satisfactorily, by means of baths, compresses, inhalations, drinks, and by the intravenous route. As the rays of radium strike into and melt and destroy the cells of new growths, so, in like manner, does it not seem possible and even probable that the iodide salt of potassium, by means of its very penetrating *beta*-ray, can bombard and destroy syphilitic nodes and gummata. Also, there appears to be good reason why iodide of potassium is often used, apparently with success, in arteriosclerosis, simple goitre, and in cervical and other glandular enlargements. Again, the acetate and citrate salts of potassium are regarded by many practitioners as beneficial in the inflammatory and sclerosed conditions of acute and chronic nephritis. Nor do these compounds of potassium exhaust the list of those that have a peculiarly irritating or destructive action on the tissues; for instance, the nitrate, the chlorate, and the carbonates.

The comparative energy of the three different kinds of radiation may be stated as follows: *alpha* rays 90 per cent., *beta* 4 per cent. and *gamma* 5 per cent. Thus, the *alpha* particles are the most energetic, but they have very little penetrating power, and are stopped by the wall

of the container or even by a sheet of thin writing paper.

The penetrating power of these different rays may be roughly indicated by the following figures: *alpha* 1; *beta* 100; and *gamma* 10,000. the range in air is for *alpha*, from radium, with ordinary temperature and atmospheric pressure, 3.3 centimeters; from radium about seven; and from *thorium C* 8.6 centimeters (about  $3\frac{1}{2}$  inches), which latter elements has the longest range for its *alpha* particle of any of the active substances. One of the most astounding phenomena connected with radio-activity is the enormous speed with which the different rays are shot out from the atom, which until recently was supposed to be indivisible. The *alpha* particle is emitted with an average speed of one-fifteenth of that of light, and the *beta* particles have a maximum velocity nearly equal to that of light, while the *gamma* rays move at the almost inconceivable rate of light—185,000 miles per second. As the *beta* particles are quite penetrating, and move through the air with an average range of 250 centimeters (100 inches) and are stopped by about two millimeters of lead ( $\frac{1}{12}$  inch of metal), it may be assumed that the *beta* rays will encounter no difficulty in penetrating the thickened wall of the largest arteries, but also, without doubt, are able to attack and bombard through the capillaries all pathological cells and new growths, on which abnormal tissue the rays seem to have a selective action. *Gamma* rays are very penetrating, some of them having been detected by the electroscope after having passed through 30 centimeters (1 foot) of iron.

As sodium is closely related, clinically as well as chemically, to potassium, it would be naturally inferred that the former element possesses at least some of the radio-active phenomena. Physicists, however, have as yet been unable to find any sign of radio-activity in any of the metals of the alkalis, except *rubidium*. Nevertheless, geologists are, according to some reports, inclined to believe that there is some evidence of the sodium in the ocean having undergone, through the forgotten ages of the past, a slow atomic transformation.\*

DANIEL CONBOY.

#### MACCABEE FREE BEDS—THEIR ABUSE.

In our going and coming among the profession of the state we have frequently heard expressions—rather emphatic—condemning the Maccabee Free-Beds. The objections raised are that many patients are admitted on these so-called “free-beds” who are perfectly able to

pay for their hospital care and surgeon's fees; in addition, that these patients are not entitled or worthy of this charity work and service; that these lodges are using the free-bed service as an inducement for securing members; that people when learning that they are in need of a surgical operation join the lodge for the sole purpose of being admitted upon these beds, thus avoiding payment of hospital and surgeon's fees; that while these free-beds were purposely and primarily intended for the care of worthy poor, still they admit and care for patients abundantly able to pay; that surgeons in charge of these free-beds are working an injustice upon the general practitioner and other surgeons in thus being the “dupe” of this lodge in operating upon patients who are not entitled to such charity service; that instances have occurred wherein patients have entered private rooms, paid for the difference in price between the free-bed and the private room, employed special nurses and the surgeon has operated upon them without receiving a fee—while the patient wore her diamond rings. These and similar statements regarding the abuse of this free-bed service have reached us from time to time.

Unhesitatingly we condemn every physician, surgeon and hospital who aids and abets such transactions. The plan, the method, the entire procedure is working an injustice upon every doctor, surgeon and hospital that is not connected with such a free-bed arrangement. We desire to condemn it as emphatically as possible. Grant such privileges to every worthy poor and indigent patient, unable to pay, most assuredly. But be sure they are *worthy and poor*—don't take the word of the lodge representative for it, investigate yourself the merits of every case.

A stop must be put to this practice and we propose lending our influence to secure the abandonment of such a travesty upon the doctors and surgeons of Michigan. We are sorry that we have not kept a record of the cases reported to us in which the patient did not merit this charity and in which the attending physician and surgeon have been *robbed and cheated* out of a reasonable fee that was within the means of the patient's ability to pay.

We are making the request, so that we can show up the men and institutions fostering and abetting such condemnable practices, for every doctor who knows of such a circumstance to supply us with the patient's name, residence, condition, financial status, hospital to which she went and the name of the surgeon who operated “free” and any other items that would be of interest in showing up that particular instance. This data we propose publishing in *The Journal* together with the hospital and surgeon's name so that the profession at large may

\*E. Rutherford: Radio-active Substances and their Radiations. 1913.

M. Curies: Traité de Radio-activité. 1910.



know these men and institutions and when they have cases to refer they will not send them to these men who are robbing them of just fees and imposing upon the entire medical fraternity. *We promise not to publish the name of the informant* but insist that he sign such statement so that we may be prepared to answer any challenge the accused may make. We propose publishing facts and to investigate each circumstance and thus be eminently fair.

We ask your co-operation to root out this evil and assist us in gaining the necessary data to ascertain how extensive the practice has become. Certainly the numerous instances in which these complaints have reached us warrant *The Journal* to undertake the effort to secure the abatement of this underhanded work. The June issue is open for your statement.

#### THE OFFICIAL CALL FOR PAPERS.

Members desiring to read a paper before any section of our State Society during the sessions of the Annual Meeting at Lansing, Sept. 10-11, are hereby requested to at once communicate their intentions to the section officers. In order that definite arrangements may be made, the officers request that they be furnished with the title of the paper, a brief synopsis of its contents and whether or not it will be illustrated.

The officers of the various sections are:

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Benj. A. Shepard, Secretary ..... Kalamazoo

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##### *Ophthalmology and Oto-Laryngology.*

C. E. Baker, Chairman ..... Bay City  
Wilfred Haughey, Secretary .... Battle Creek

#### *Editorial Comments*

*The Medical Council*, with advertising pages stained with copy of Pepto-Mangan, Prunoids, Anasarcin, Campho-Phenique, Burnham's Soluble Iodine and other equally as undesirable and unreliable advertising matter, announces in its April number that it is going to make a "diagnosis of the unrest and agitation that is disturbing the medical profession." The editor proposes to reach such a diagnosis by making a series of hurried visits to several localities and to sum up his conclusions from the observations he thus makes and thereby hopes to attain

a final conclusive opinion as to "what's wrong."

Incidentally it is stated that the editor has done considerable traveling in sanitary investigations. This is the first intimation that we have received that the cause of the unrest was due to "inefficient sanitation" and that a sanitary expert's service were required to propound a solution of the difficulty.

In the same issue the visit to New York is described. The description commences with a criticism of the Council on Pharmacy and Chemistry of the A.M.A.; recapitulates the tale of woe of several pharmaceutical manufacturers who do the "sob-act" because the Council on Pharmacy and Chemistry has compelled them to be honest in regard to their manufactured products and who bemoan the fate that has thus befallen them. A few generalities are indulged in in discussing the National Formula Propaganda, Hospital and Dispensary abuses; twelve lines are devoted to Sanitation, a column on New York physicians which does not reveal any unknown traits, and a quarter of a column of business comment with a closing statement that *The Council* has a large list of subscribers in New York.

When we commenced to read this article we thought that there was about to be revealed to us an inside view of the metropolitan profession, its foibles, weaknesses, scandals as well as a word picture of its better qualities and the underlying cause that produced each condition. Yes, we have been disappointed for we failed to find any comment as to the cause of "unrest" in the profession and note that the only "unrest" that existed occurred in the manufacturer's domain. A similar article pertaining to other districts to be visited will cause us to feel that the end sought will not be attained—except probably in the Chicago Medical Society.

If our contemporary would only pluck the beam out of its own eyes it might be able to observe some of the causes for "unrest" in its very pages, and, seeing we hope that he will cleanse them from much that has been demonstrated unclean. By so doing he will have taken a long step toward pouring oil upon the troubled waters of a profession that cannot help but be restless under the conditions that govern many medical publications. It makes us restless to think that a publication can try to "get-a-way" with such "rot" and in the disguise of a would-be reformer, play to the galleries where sit the spectators already wearied from observing misbranded reform propagandas emanating from those who are still "un-clean."

The "Go To Church" movement, due to press publicity, has been carried out more or less successfully in several cities. Apropos of this slogan, probably plagiarizing it, we are venturing the suggestion: That every society se-

lect one of its regular meeting dates and adopt for its slogan—"Go To The Medical Meeting." Then let the energy be exerted to get every reputable and eligible doctor in your county, be he member or not, to attend this meeting. Besides arranging for an instructive scientific program have the program committee arrange for two or three five minute talks in which those present will be told the "How, Why and What For" it is essential for every doctor to belong to his county society, attend and take part in every meeting that his society holds. By means of such an exhibition, universal throughout the entire state, much new life, enthusiasm and efficiency will be instilled in our component organization. Who's first?

We ask but fifteen minutes of your time to peruse our advertising pages carrying none but honest advertisements from reliable business firms and manufacturers. Here and there you will undoubtedly note something that you need and intended to purchase. Send your order to those who patronize *your Journal* and also tell them why you are doing so. These firms will accord you courteous and honest treatment and their prices will be equal to those of any competitor who is not advertising in *your* publication. *Your* patrons are entitled to your patronage.

The Annual Meeting of the American Medical Association will be held in Atlantic City, June 22 to 26. Dr. Vaughan will become the active president of the Association at that time. Michigan should be well represented upon the registration rostra.

In a recent medical publication we noted a doctor's (?) article in which this statement was made: "The function of the appendix is to secrete the lubricant for the bowel and its removal is equivalent to causing the patient's death inside of seven years." To properly express our opinion of such "mush" would compel us to use words that would not look well in print. The wonder also is that any editor would countenance the publication of such a statement. Someone has remarked that every death from appendicitis might have been prevented and that when death did result either the patient, his family and friends or the attending physician is at fault and accountable for the fatal termination. There is no medical treatment for appendicitis. Surgery—early—offers the only haven of safety.

"Clinic Week" and "Clinics" have proven themselves to be profitable occasions for all physicians. It is not always essential that they be national or statewide in their scope. Commu-

nity Clinics can certainly be made extremely instructive and profitable.

To attend a national or state clinic demands that a doctor give up his practice for a week and in addition expend a considerable amount of money for hotel and traveling expenses. To attend the meetings of the national and state organization and the now recognized National Clinic Week calls for the spending of a goodly amount of money. Admittedly it is a profitable investment and one which we desire to still further encourage. However, we are of the opinion that a little more devotion of time by all of us to Clinical teaching and study will be of value and profit to every physician, and so we recommend the conducting of two or more Community Clinics each year and which may be attended by every physician in the community with a smaller expenditure of time and money.

Detroit already holds such a clinic—The Clinic of the Alumni of the Detroit College of Medicine and Surgery. Grand Rapids, Saginaw, Bay City, Flint, Kalamazoo, Traverse City, Cadillac, Big Rapids, Petoskey, Marquette, Calumet, Escanaba and several other cities may readily establish such community clinics. Two, three, four or five days may be filled with special work in the several fields of medicine and surgery and the evenings may be profitably devoted to papers and discussions. If desired, outside men may be readily secured to conduct some of the work. We feel the suggestion worth the trial.

Although our Annual Meeting is still some months distant it is well to commence thinking about it and when planning your summer vacation do not forget to arrange so that it will be possible for you to be in Lansing on September 10th and 11th.

Volkman's contraction, or more properly, an ischemic myositis of the muscles of the forearm is becoming more common as a distressing sequelae to fractures of the radius and ulna. Murphy has rather aptly termed it a "surgeon's lesion" and ascribes its frequency as being due to the placing of a tight bandage or cast on the arm and thereby causing a compression myositis which is followed by cicatricial contraction. In discussing this condition Murphy states: "It is never a nerve lesion. It is never a traumatic lesion. It is always a surgeon's lesion. The damage is always done during the first forty-eight hours of the compression." The contraction of the tendons is not noticed until several weeks have elapsed. Well may we ask how can this be avoided—by being constantly alert and never apply a fixed dressing so tightly as to cause compression that will be intensified by the subsequent swelling and edema that attends

the original trauma. Should the patient, in spite of our precaution, complain of severe pain or notice extensive swelling and circulatory interference instruct him to not delay in calling on you or if that is impossible and you cannot reach him in a few hours then instruct him to immediately loosen all the dressings. This is the only measure that will prevent myositis and subsequent tendon contraction.

Unless you patronize our advertisers you cannot hope or reasonably expect to receive a \$3.00 *Journal* for \$1.00. If you will help us boost a little by trading with our advertisers we will soon be able to send you a \$5.00 *Journal* for \$1.00. Which shall be?

In this issue will be found the names of those who have been placed on the suspended list by reason of their non-payment of their dues. This list was not published in the April number for the very reason that some 500 names and dues were received on the 31st day of March and having thus paid before April 1st it would have been an injustice to have published their names as being delinquents.

We dislike very much to publish the names of the delinquents this month for we feel that the majority of them have simply been careless and thus permitted their dues to lapse. We have, however, no alternative and these men are now without the protection of the Defense League and will continue to be so until their dues are received and should they be sued for any services rendered to a patient from April 1st until they pay their dues they will not be entitled to protection for such suits even though they should again be re-instated; their *Journal* was discontinued with the April issue and they have been reported to the Secretary of the A.M. A. as being dropped for non-payment of dues.

We sincerely hope that they will take immediate steps to secure their reinstatement. They are forfeiting their affiliation with an organization that nets them greater returns than any other organization.

The American Medical Association's Committee on "Conservation of Vision" have issued ten pamphlets entitled as follows: The Eye and Its Functions; Eye-Strain; Auto-Intoxication and the Eye; Trachoma in Eastern Kentucky; The Relation of Illumination to Visual Efficiency; Wearing Glasses; Industrial and Household Accidents to the Eye; Schoolchildren's Eyes; Lenses and Refraction; and Care of the Eyes. They are written for distribution among the public and contain much that is of value and instructive. They may be obtained from the Association's office by those interested in this work. They demonstrate the excellent work that is being done by the committee on

Health and Public Instruction. This same committee has also ready for distribution the following pamphlets: Control of Cancer; The Municipal Regulation of Milk Supply; Child Culture the Function of Organized Medicine; and Death and Blindness from Wood-Alcohol Poisoning. You will do well to secure these publications for distribution in your community.

FOR RENT is the sign that is tacked up on the building formerly occupied by the Michigan College of Chiropractic that was located in Grand Rapids and turned out pseudo-doctors in three months. Thanks to the amendments passed by our recent legislature this school has been compelled to close-up. We wonder what its graduates now think of their profession.

*The Bulletin* of the Calhoun County Medical Society is the latest addition to the list of Bulletins issued by our County Societies. It is a four-page folder, gotten out in neat and attractive style and of credit to its editor, A. F. Kinsley, the secretary of the society. This society has also abandoned holding quarterly meetings and will now meet semi-monthly. The impression that we gained from a recent visit is that this society will soon be one of the banner ones of the state and in which membership will be a valuable asset to every doctor in Calhoun County.

#### MEMBERS SUSPENDED FOR NON-PAYMENT OF DUES.

Herewith we are publishing, in compliance with the instructions of the House of Delegates, the list of members whose dues were unpaid on April 1st. According to these instructions their names have been removed from our roll of membership; their names were removed from *The Journal* mailing list and *The Journal* discontinued on April 1st; they are without protection of the Defense League and forfeit the right to receive protection should any action arise against them for services rendered during their period of suspension; they have been reported as suspended to the Secretary of the American Medical Association and so forfeit their rights in that organization.

The total number thus suspended is 389, or 6½ per cent. of our entire membership. We have endeavored to be very careful in checking over our list and should perchance, any errors occur we will be only too glad to correct them if brought to our attention.

It is a disagreeable task to prepare this copy for publication. We dislike very much to publish this list because we felt that the vast majority of these names are on the list solely by reason of carelessness in not promptly paying the required dues, ample notice having been given by local secretaries and by reminders published in *The Journal*.

We plead that those whose names appear on this list immediately take the necessary steps to secure their reinstatement. Of course they will not see this list because their *Journal* has been discontinued. We request every member to peruse the list of his



county and note whether or not any of his friends' names are listed. If so please make it a point to speak to him about it and induce him to reinstate himself.

## ALPENA COUNTY

Henrys, Wm.  
Jackson, John S.  
Komoracki, Anton

Miller, R. R.  
Purdy, John W.  
Wilson, John—6

## BARRY COUNTY

Duller, D. E.  
Lowry, G. W.  
McIntyre, C. S.

Rigterink, J. W.  
Sheffield, F. G.  
Shilling, F. F.—6

## BAY COUNTY

Ballard, S. L.  
Brown, F. W.  
Dumont, V. H.  
Gale, H. M.  
Gallagher, M.  
Gustin, S. E.

Horne, G. E.  
Keho, John A.  
McNaughton, G. P.  
Ovenshire, B. H.  
Suylanat, C. C.  
Urmston, P. R.

Warren, E. C.—13

## BENZIE COUNTY

Covey, E. L.

Edmunds, G. G.  
Kinne, H. J.—3

## BERRIEN COUNTY

Allen, R. C.  
Bartlett, H. G.  
Balknap, F. R.  
Foote, V. R.  
Gregg, U. S.  
Harrison, L. H.

Helkie, W. L.  
King, L. A.  
Martin, F. H.  
Rosenberry, A. A.  
Schmiedener, Hattie A.  
Yeomans, T. G.—12

## BRANCH COUNTY

Heator, J. J.

Whitmore, H. W.  
Wood, D. H.—3

## CALHOUN COUNTY

Dockry, W. E.  
Durrie, Anna

Gibbs, M. S.  
Morse, J. F.  
Risley, E. H.—5

## CASS COUNTY

Bonine, J. G.  
Fenstermacher, C. C.  
Holland, Marion  
Kelsey, J. H.

Loupee, S. L.  
McCutcheon, W. C.  
Phillips, H. H.  
Squires, D. E.—8

## CHARLEVOIX COUNTY

Wilkinson, A. M.—1

## CHEBOYGAN COUNTY

Chapman, W. E.  
MacGregor, A. B.  
St. Armour, S. A.

Stringham, J. R.  
Stringham, W. R.  
Tweedle, C. B.—6

## CHIPPEWA COUNTY

Campbell, E. H.  
Ferguson, J. A.  
Gibson, R. E. Lee

McCandless, A.  
Townsend, W.  
Yale, I. V.—6

## CLINTON COUNTY

Abbott, G. T.  
Hoover, H.

Luton, F. E.  
McGillcuddy, Jas.—4

## DELTA COUNTY

Kee, D. N.

Lemire, W. A.—2

## DICKINSON-IRON

Alving, O. E.  
Collins, C. D.

Crowell, J. A.  
Dockery, M. F.  
Remillard, J. L.—5

## EATON COUNTY

Hixon, A. N.  
Jones, F. A.  
McLaughlin, C. L.

Rees, H. B.  
Snell, D. M.  
Wasson, C. B.  
Weaver, F. A.—7

## EMMET COUNTY

Crotser, L. S.

Moorman, E. R.  
Risk, R. A.—3

## GENESEE COUNTY

Gogshall, B. W.  
Houton, J. H.

Jenne, B. H.  
Pifer, L. J.  
Robb, G. W.—5

## GOGEBIC COUNTY

Kelly, E. H.  
Madajeski, E. H.  
O'Brien, W. J.

Paradise, R. A.  
Pierpont, D. C.  
Pinkerton, W. J.  
Walsh, J. L.—7

## GRAND TRAVERSE-LEELANAU

Carrow, F.  
Johnson, G. M.

Miller, E. A.  
Payne, W. M.—4

## GRATIOT COUNTY

Pankhurst, C. T.—1

## HILLSDALE COUNTY

Bates, J. A.  
Clobridge, C. E.

McFarland, O. G.  
Whelan, B.—4

## HOUGHTON COUNTY

Abrams, J. C.  
Bourland, P. D.  
Edwards, S. A.  
Gregg, W. T. S.  
Joy, H. M.  
Krueger, O. E.  
McDonald, N. S.  
MacQueen, D. K.  
McNaughton, P. D.

Maas, R. J.  
Matchette, W. H.  
Orr, G. W.  
Rhines, J. J.  
Sutton, D. C.  
Van Dyke, W. H.  
Vercellini, C. E.  
Whitten, W. P.  
Wiley, R. E.—18

## HURON COUNTY

Frenzel, Otto  
Friedlander, B.  
Jackman, J. W.

Lyman, M. R.  
Rexford, W. K.  
Seville, L. J.  
F. C.—7

## IONIA COUNTY

Alton, R. W.  
Braley, F. W.

Hargrave, F. A.  
Martin, F. W.  
Strahan, D. H.—5

## INGHAM COUNTY

Branch, G. F.  
Bruegel, O. H.  
Cochrane, W. A.

Cushman, M. L.  
Shumway, F. W.  
Wade, G. B.—6

## ISABELLA-CLARE

Brondstetter, M. F.

Powers, C. J.  
Stanton, C.—3

## JACKSON COUNTY

Hackett, T. E.

Smith, J. C.  
Townsend, G. H.—3

## KALAMAZOO COUNTY

Cornell, A. B.  
Heasley, W. H.  
Henwood, A. E.  
Hobbs, E. J.  
Lee, J. W.

Lewis, H. F.  
Osmun, E. D.  
Ransom, T. H.  
Rowe, M. J.  
Welsh, F. J.—10

## KENT COUNTY

Apted, Ralph  
Beel, H. J.  
Breece, R. C.  
Chadwick, H. J.  
Chappell, L. E.  
Dales, E. W.  
Earle, E. C.  
Easton, G. A.  
Edie, J. O.  
Fairbanks, C. H.  
Ferguson, J. E.  
Gordon, T. D.  
Grimes, J. N.  
Heasley, J. A.

Henry, Jas. Jr.  
Herrick, O. E.  
Hilliker, J. B.  
Hirschberg, F.  
Holcomb, J. N.  
Hooker, C. E.  
Kelley, C. M.  
Kinsey, F. C.  
Koon, T.  
Northrup, Wm.  
Patterson, A. J.  
Roller, L. A.  
Schurtz, Perry  
Sinclair, D. S.  
Sinclair, M. C.—29

## LAPEER COUNTY

Boulton, A. O.  
Chapin, C. D.  
Snow, S. A.

Suiter, J. P.  
Thomas, J. O.  
Traphagen, L. A.—6

## LENAWEE COUNTY

Clemes, W. T.  
Conklin, H. R.  
Hendershot, E. E.  
Hyde, C. C.  
Jewett, W. E., Sr.  
Kirkpatrick, C.  
Lamley, G. H.

Lochner, G. M.  
Morden, W. S.  
Ross, G. W.  
Tallman, C. R.  
Towne, L. S.  
Tuttle, J. L.  
Wilcox, A. E.—14

## LIVINGSTON COUNTY

Cunningham, J. E.  
Pearson, A. H.

Sigler, C. L.  
Sigler, H. F.—4

## MACOMB COUNTY

Roberson, G. G.

Wiley, H. H.—2

## MANISTEE COUNTY

Keough, E. M. Kirkland, R. J.—2

## MARQUETTE-ALGER

Anderson, A. H. Gourdeau, A. E.  
Bergeron, J. D. Ptolmy, H. H.—4

## MASON COUNTY

Heysett, F. W. Martin, W. G.  
Switzer, G. O.—3

## MECOSTA COUNTY

Walker, C.—1

## MENOMINEE COUNTY

Phillips, B. T.—1

## MONTCALM COUNTY

Miller, N. W. Sayles, C. C.  
Townsend, G. S.—3

## MUSKEGON-OCEANA COUNTY

Black, B. F. Eastman, B. R.  
Blanchett, V. J. Keyes, L. W.  
Busard, R. I. Powers, L.  
Smith, A. A.—7

## NEWAYGO COUNTY

Boyd, J. L. Rolison, S. B.—2

## OAKLAND COUNTY

Brannock, A. L. Mack, C. W.  
Chapman, H. S. Manley, Ora.  
Chapman, J. B. Robb, S. B.  
Drake, G. W. Shaw, N. T.  
Foley, C. J. Ulothe, M. J.  
Galbraith, S. E. Van Sickle, J. R.—12

## O. M. C. O. R. O.

Abblett, J. H. Keyport, C. R.  
Insley, S. N. Kiehl, H. B.  
Wood, R. H.—5

## ONTONAGON COUNTY

Cornell, H. D. Porter, W. K.—2

## OSCEOLA COUNTY

Barnard, J. H. Nolte, H. S.—2

## OTTAWA COUNTY

Mabbs, J. A. Vandenberg, W. J.  
Presley, W. J. Walkley, W. S.  
Smith, F. D. Winter, W. G.—6

## PRESQUE ISLE

Campbell, A. W. Shirley, V. W.—2

## SAGINAW COUNTY

Dickinson, W. L. DeFoe, W. A.—2

## SANILAC COUNTY

Smith, R. Wiers, W. W.—2

## SCHOOLCRAFT COUNTY

Burr, G. C.—1

## SHIAWASSEE COUNTY

Bailey, A. L. VanLiew, V. C.  
Benjamin, W. O. Watts, F. A.  
Wilson, P. S.—5

## ST. CLAIR COUNTY

Clements, F. W. Dunn, R. J.—2

## TUSCOLA COUNTY

Dunning, E. C. Walworth, G. W.—2

## WAYNE COUNTY

Adams, J. R. Kimsey, J. A.  
Applebee, W. King, H. S.  
Baker, Wm. R. Klipp, A. W.  
Baskerville, R. J. LaFerte, D.  
Beall, J. A. Lawton, T. M.  
Beattie, R. Lee, A. C.  
Binning, D. E. Leonard, C. B.  
Brown, G. V. Lukaszewski, S. J.  
Buesser, F. G. McArthur, N.  
Burge, C. W. McClelland, R. J.Burke, F. B.  
Clark, D. R.  
Crittenden, C. L.  
deBlois, R. F.  
Dick, K. W.  
Donald, W. M.  
Dunn-Roe, Anna T.  
Edwards, E. P.  
Eede, E. E.  
Estabrook, B. U.  
French, A. L.  
Garber, J. N.  
George, C. H.  
Goodenow, R. J.  
Hamilton, J. T. S.  
Hartman, L. B.  
Henderson, E. W.  
Herbert, L. H.  
Herman, S. J.  
Hoag, A. B.  
Howard, J. J.  
Hurst, Alice  
Imrie, A. W.  
Inglis, David  
Jennings, C. G.  
Johnson, A. H.  
Johnson, R. K.  
Judd, C. H.  
Kenning, Thos.  
Kestell, J. R.McFall, G. H.  
McMahon, G. H.  
Neubauer, B. B.  
Pfeiffer, R. L.  
Potter, W. A.  
Przybylowski, F. J.  
Radzinski, A. J.  
Roach, J. J.  
Roberts, F. J.  
Ross, W.  
Rothchild, D.  
Rutledge, J.  
Schureman, J. W.  
Sherman, A. T.  
Sibley, C. P.  
Sill, J.  
Sipe, G. K.  
Slevin, J. H.  
Smith, C. A.  
Spitzley, W. A.  
Stafford, C. M.  
Stirling, A. M.  
Thomas, L. C.  
Voorheis, W. J.  
Walker, T.  
Warner, J. H.  
Watson, C. E.  
Willson, J. W.  
Wilson, W. A.  
Zimmer, L. L.—80.

## WASHTENAW COUNTY

Benedict, W. L.  
Breaky, W. F.  
Cumming, J. G.  
DeNancere, C. B. G.  
Gates, N. A.  
Hopkins, W. E.  
Huber, G. C.  
Keating, J. W.Loree, I. D.  
Oberlin, E.  
Palmer, G. W.  
Pettis, J. H.  
Schmidt, H. W.  
Tefft, F. E.  
Williams, F. E.  
Woodbridge, C. N.—16.*Deaths*

**Dr. Walter Colin** of Barryton, Mich., died during the month of January, the cause of death being pernicious anemia. Dr. Colin had been a member of the Mecosta County Medical Society and of the Michigan State Medical Society since 1905.

**Dr. Herbert Otto Statler**

The sudden death of Dr. Herbert Otto Statler shortly before five o'clock Sunday morning, March 29, from angina pectoris was a shock to the city, as Dr. Statler was one of the best known physicians of Kalamazoo, having served as Health Officer and having been associated with many charitable organizations.

While Dr. Statler knew that he had heart trouble, he did not make the fact known to his family or friends, and had apparently been in good health. About three-thirty o'clock Sunday morning he was called up in regard to a patient whom he said he would go out and see if necessary. It was only half an hour later when he was himself taken ill. Medical aid was summoned at once, but life was gone before the family fully realized his critical illness.

Herbert O. Statler was born July 15, 1868, in Schellburg, Pa. He was graduated from the medical department of the University of Michigan, April 6, 1889, coming to Kalamazoo shortly after. He was assistant physician at the Michigan State Hospital, during which time

he met Miss Helen Curtenius, daughter of Mrs. Kate W. Curtenius, whom he married March 29, 1899.

Dr. Statler took his post-graduate course at Johns Hopkins University, Baltimore, and later did special medical work in New York and Boston. He was a member of the Sigma Phi fraternity at the University of Michigan, a member of the Kalamazoo Academy of Medicine, and of the Kalamazoo Country Club.

Besides his widow he leaves two children, Master Frederick and Miss Wilhelmina Statler.

Members of the Academy of Medicine met in special session March 30, 1914. The following message of condolence was presented by the Memorial Committee.

"In memory of Dr. Herbert O. Statler:

"The Angel of Death has again entered this society and taken one of its most respected members. In the sudden and untimely death of Dr. Herbert O. Statler the Academy of Medicine has suffered a distinct loss. A man of high ideals both as physician and layman. As a physician, he was conscientious, always giving to his patients the most careful and skillful attention; not hasty in judgment; conservative in the practice of medicine and surgery, his opinion was much valued. As a layman he was a gentleman.

"No greater praise can be given him than that those who knew him best loved him most. He had a keen appreciation of nature and with his family and friends spent much time in the great out-of-doors.

"His death comes as a terrible shock, as he had not been ill, and coming so suddenly we are reminded of the uncertainty of human life; a little gleam of time between two eternities.

"To his wife and children we extend our sincere sympathy in this untimely passing away of a dear husband and father.

Signed,

Orton H. Clark

E. J. Bernstein

W. A. Stone

S. R. Light

Committee."

**Dr. D. B. Cornell** of Saginaw died April 2nd, at his home, the cause of death being blood poisoning.

Dr. Cornell was a well known eye, ear, nose and throat specialist. He located in Saginaw in 1889 and has been a practitioner there since.

He leaves a wife and one daughter.

**Dr. Wm. D. MacQuisten**, one of the best known physicians of East Detroit, died April 6th as a result of a disease of the throat.

He was graduated from the Michigan College of Medicine in 1892, and had been a practicing physician ever since.

## State News Notes

A cordial invitation is extended to all the members of the medical profession in Michigan to attend the annual clinic week of the Detroit College of Medicine and Surgery—May 27th to June 4th. A nominal fee of two dollars to cover necessary expenses, admits one to all the clinics, lectures and all other functions of a social or amusement nature. The committee in charge have secured the presence of men of national reputation to conduct certain of these clinics. Those expected to be present are: Dr. Martin H. Fisher, Department of Physiology, University of Cincinnati; Dr. William F. Braach, Rochester, Minn.; Dr. John A. Fordyce, New York; Dr. W. Wayne Babcock, Philadelphia; Dr. Robert H. Halsey, New York; Dr. F. W. Archibald, Montreal; Dr. Hugh McCallum, London; Dr. Channing W. Barrette, Chicago; Dr. Charles L. Mix, Chicago; Dr. S. G. Gant, New York City; Dr. T. W. Pottenger, Monrovia, Calif. Such an array of invited clinicians conveys the assurance that the week will be a most profitable and instructive one. Here is an excellent opportunity for the physicians of Michigan to witness the work of the leaders in the Detroit profession as well as that of the invited guests. Plan to be in Detroit during the entire clinic week.

At a meeting recently in Detroit, a branch society of the American Urological Association was organized consisting of the following members:

Dr. F. W. Robbins, Dr. W. P. Manton, Dr. Geo. Potter, Dr. Wm. E. Keane, Dr. W. C. Martin, Dr. John Dodds, Dr. W. H. Plaggemeyer, Dr. M. A. Feilheimer, Dr. Theo. H. Smith, Dr. W. H. Hutchings, Dr. F. H. Cole.

Dr. Rudolph J. E. Ogden of Cadillac will sail for Europe on the steamer Imperator, May 16th. He will be absent for a period of six months during which time he will be enrolled as a resident student in Anatomy and Pathology and Clinical Surgery in the University of Berlin.

Dr. A. A. Solberg and Miss Olga Grotte of Ishpeming were united in marriage on April 8th. The Doctor will make his future home in Chicago where he has accepted the position as assistant surgeon for the Illinois Central railway.

Dr. Nelson McLaughlin of Grand Ledge has been appointed as a member of the state board of registration in medicine to serve for the unexpired term of Dr. G. W. Nafe, deceased.

The Chicago Medical Society will hold its Third Annual meeting of Alienists and Neurologists of the United States, for the discussion of Mental Diseases in their various phases, on July 14 to 18.

Dr. G. W. Bird, wife, and son of Flint, sailed for Europe on April 16th. While abroad the Doctor expects to spend several months in the clinics in Vienna.

Dr. R. C. Allen of St. Joseph and Dr. H. S. Carr, of Niles, have been elected president and secretary of the Board of Pension examiners of that city.

Dr Charles H. Oakman of Detroit was elected president of the Board of Health to succeed Dr. J. B. Kennedy whose term as member of the board had expired.



Dr. E. M. Libby and son of Iron River have sailed for Europe and expect to be absent for several months which time will be spent in visiting the continental clinics.

Dr. Geo. B. Eusterman of Rochester, Minn., addressed the meeting of the Calhoun and Kent Societies on April 8th and 9th.

Dr. and Mrs. Ralph Fuerbringer of Saginaw have returned home after a six months absence spent in Europe.

Dr. and Mrs. Laniel Todd of Adrian celebrated the sixteenth anniversary of their marriage on March 24th.

Dr. A. S. Kimball of Battle Creek has resumed practice after several weeks illness caused by an infected thumb.

Dr. R. E. Balch of Kalamazoo has returned from an extensive vacation that was spent in the south.

Dr. J. H. Kellogg of Battle Creek has returned after a five weeks absence spent in Florida.

Dr. George H. Lynch of Big Rapids has been elected mayor of that city.

Dr. R. C. Main has been appointed as the full time health officer of Marquette.

The death rate in Menominee is 8.9 per cent., the lowest in the history of that city.

## County Society News

### BERRIEN COUNTY.

The regular monthly meeting of the Berrien County Medical Society was held April 19th, with sixteen present.

Dr. Inch of Kalamazoo gave an address. Judge Barr of the Probate Court also addressed us relative to the care and medico-legal phases of the insane, the feeble-minded, and wards of the probate court.

Dr. Mabel Elliott of Benton Harbor was elected secretary in place of Dr. Gregg, who has moved to Kalamazoo.

C. W. MERRITT, PRESIDENT.

### CALHOUN COUNTY.

April 7, 1914.

1. Clinical Consideration of Gastric Disturbances. Dr. George Bysshe Eusterman, Rochester, Minn. Discussion—Dr. A. S. Kimball, Dr. Theodore Kolvoord.

2. Dermatological Clinic. Dr. Henry Rockwell Varney, Detroit.

Dr. Varney will discuss such cases as may be presented by the members, and it is hoped that a good supply may be on hand. Members presenting cases should be prepared to give as complete history as possible, and thus assist in the general interest, and help to make the meeting more valuable.

*Calhoun County Bulletin* herewith makes her bow, and presents you with Vol. 1. No. 1.

A feeling among the membership has been growing for some time that such a publication was needed in our Society, and how well it succeeds depends upon the support received from the membership.

Tell us how you like it and how it may be made better. We hope you will feel free to say what you would like to see in *The Bulletin*, for this is the property of the membership, and is prepared wholly to serve the membership.

Will you not be thinking how the organization of a staff of workers to carry out this publication can best be arranged? Considerable assistance is necessary, and when you are called on, please be ready to respond.

A. F. KINGSLEY, SECRETARY.

### DETROIT OTO-LARYNGOLOGICAL SOCIETY

The Detroit Oto-Laryngological Society made its annual visit to the Clinic of Oto-Laryngology, University of Michigan, March 17th, 1914. The afternoon was purely a clinical one and the following thirty-five cases were demonstrated by A. R. Bishop Canfield and his staff:

Case 1. Acute Mastoiditis following nasal infection. Operated and convalescing.

Case 2. Acute Mastoiditis following tonsillitis. Operated and convalescing.

Case 3. Acute Exacerbation of Chronic Mastoiditis. Operated upon and convalescing.

Case 4. Acute Mastoiditis following coryza, which had been treated persistently elsewhere with autogenous vaccine. Owing to the fact that the patient was suffering from chronic interstitial nephritis, a complete mastoid was performed under local anesthesia.

The following four cases were shown in order to demonstrate four different directions in which extension takes place from the mastoid process into the neighboring structures:

Case 5. Acute Mastoiditis with post-aural abscess following tonsillitis. Perforation had taken place just back of the supra-meatal triangle.

Case 6. Acute Mastoiditis following grippe. Perforation had taken place through the anterior surface of the tip and had established a large neck abscess lying upon the vertebrae.

Case 7. Acute Mastoiditis with Sinus Thrombosis and large Abscess at Base of Skull. Perforation had taken place through the posterior surface of the tip.

Case 8. Acute Mastoiditis following head cold. Perforation had taken place along the surface of the sigmoid groove on to the deep neck muscles and into the floor of the mouth.

The following two cases of chronic suppurative otitis media with chronic mastoiditis were demonstrated as patients upon whom a radical mastoid was about to be performed:

Case 9. A Suppurative Otitis Media of 15 years' standing, upon whom two mastoid operations had been performed elsewhere without relief either of discharge or headache. Examination demonstrated complete destruction of the cochlear apparatus without involvement of the vestibular apparatus.

Case 10. Chronic Suppurative Otitis Media of three years' standing, the ear having been infected from an atrophic rhinitis. Inasmuch as treatment had been of no avail, this patient was prepared for a radical mastoid operation.

The following five cases were demonstrated as suffering from Chronic Suppurative Otitis Media, the important etiological factor of which was the presence of adenoids and tonsils:

Case 11. Marked destruction of both tympanic membranes and intra-tympanic structures with foul-smelling pus and cholesteatoma in both ears. Adenoid and tonsil operation to be performed.

Case 12. Same as Case 11.

Case 13. Ditto.

Case 14. Ditto.

Case 15. Ditto.

Case 16. A case of crushing fracture of the nose with complete dislocation of the septal cartilage into the left nostril. Fracture of both nasal bones and frontal processes of the superior maxilla, the whole being forced down into the left nostril so as to completely occlude it.

Case 17. A case of Chronic Empyema of the Right Frontal Sinus and Ethmoid, upon which a submucous resection had been done on account of a high deviation to the affected side, following which a radical operation was performed upon the right frontal and ethmoid.

Case 18. A case of Empyema of the Frontal Sinus, upon which a conservative external operation had been performed.

Case 19. A case of Arterio-Venous Aneurism, probably between the ophthalmic artery or some of its branches and the cavernous sinus. Patient had been shot by a 32 calibre revolver through the hard palate, ball passing through the skull and reaching the posterior surface of the apex of the petrous pyramid.

Case 20. A case of Recurring Laryngeal Polyp with Tetany. Patient aged 2½ years.

Case 21. A case of Extensive Atrophic Rhinitis, which showed the beneficial effect of nasal massage.

Case 22. A case of Post-Nasal Fibro-Sarcoma, operated upon a year previously by splitting the palate and removing the floor of the right nostril in order to secure access to the tumor which filled the post-nasal space and was attached along the vault of the naso-pharynx, right lateral naso-pharyngeal wall and right lateral nasal wall. Patient had returned for re-operation on account of recurrence.

Case 23. A case of Squamous Cell Carcinoma of the Larynx, operated endo-laryngeal with an apparent cure.

Case 24. A case of Syphilitic Disease of both Labyrinths, showing typical reduction of bone conduction with preservation of good hearing for conversation.

Case 25. A case of Total Deafness, occurring a month after a slight trauma in patient with tabes.

Case 26. A case of Hereditary Syphilis, which had been operated upon elsewhere as a case of hypertrophied tonsils, and showing the disastrous effect of operating upon acute syphilitic lesions.

Case 27. Case of Extensive and Malignant Syphilis.

Case 28. Case of Hemorrhage of the Lenticulostriate Artery in a girl 18 years old, causing complete hemiplegia and complicating an acute otitis media. (Wassermann positive).

#### OPERATIONS.

Case 29. Adenoids and Tonsils. General anesthetic.

Case 30. Adenoids and Tonsils. General anesthetic.

Case 31. Ditto.

Case 32. Ditto.

Case 33. Cocain Tonsillectomy.

Case 34. Complete Mastoid operation for acute streptococcal mastoiditis.

Case 35. Evacuation of a large abscess of the deep neck muscles as a result of perforation through the posterior surface of the mastoid tip.

EMIL AMBERG, SECRETARY.

#### HOUGHTON COUNTY.

The Houghton County Medical Society met at Calumet April 6th, 1914. The evening was spent in discussing the business affairs of the profession in the county. The fee schedule for working men's compensation law cases aroused a spirited discussion, and the secretary was finally instructed to write the other societies in the upper peninsula regarding their attitude towards the schedule. The secretary was also asked to inform the press of the copper country to refrain from printing doctors' names in connection with their cases without the obtained consent of the physician in question.

Two new members were elected. The meeting was then adjourned to the lunch room.

I. D. STERN, SECRETARY.

#### KALAMAZOO ACADEMY.

April 14, 1914.

Reports of Cases. Dr. J. C. Maxwell, Paw Paw.

1. Salvarsan and Neo-Salvarsan in the Treatment of Syphilis. Dr. Berten M. Davey, Lansing.

Discussion of Drs. P. T. Butler, A. E. West, R. P. Stark and F. Shillito.

2. Candy Medication, Dr. Bernard Fantus, Chicago.

Discussion by Drs. J. B. Jackson, A. S. Youngs, A. L. Robinson and G. D. Carnes.

A purely therapeutic program has not been before the Academy for some months. The trend of medicine has been to make a proper diagnosis. The old adage, "Having made the diagnosis, the treatment is usually plainly evident," has often led to therapeutic nihilism. This should create a lively discussion, because of the attitude of various reputable proprietary manufacturers who have frequently violated the trust that physicians had in them by using the tactics of the purely patent medicine and quack establishments. The shot-gun prescription still is in evidence. Therapeutic accuracy has not kept pace with the scientific accuracy of diagnosis.

This is the first meeting of the second quarter. We believe the Committee Chairmen should have accomplished something during the last three months. Therefore the President wishes that each

Chairman should prepare a report at the next meeting.

C. B. FULKERSON, SECRETARY.

#### MARQUETTE-ALGER COUNTY.

The regular monthly meeting of the Marquette-Alger County Medical Society was held in Marquette on Tuesday evening, March 17th. The essayist of the evening was Dr. C. N. Bottum of Marquette, and his subject was, "Tuberculin in the Diagnosis of Tuberculosis." This timely subject was treated in an exhaustive manner by Dr. Bottum who is the physician in charge of the Marquette County Tuberculosis Sanitarium where he has about twenty tubercular patients all of the time. The use of tuberculin in both diagnosis and treatment of tuberculosis is now under criticism as is shown by the proceedings on the subject in the meeting of the British Nat. Assn. for the Prevention of Tuberculosis, and reported in the *Journal of the A.M.A.*, of March 14th.

T. A. FELCH, SECRETARY.

#### MONROE COUNTY.

The regular meeting of the Monroe County Medical Society was held at the Monroe Club on Thursday, April 16th, at 2:15 p. m., and the following program was carried out:

Paper, Subject, "Some Common Skin Lesions," Dr. J. L. Murrat, Toledo.

Paper, Subject, "Some New Methods of Treatment," Dr. L. A. Levison, Toledo.

CHAS. T. SOUTHWORTH, SECRETARY.

#### OAKLAND COUNTY.

Regular Meeting, April 2, 1914.

Supervisor's Room, Court House, 7:30 p. m.

1. Some experience in Educating Tuberculous Patients. C. T. Starker.

Discussion.

2. Panama and the Canal (Illustrated). M. W. Gray.

3. Medicine and Sanitation in the Canal Zone.

H. L. Tenkle.

J. J. MURPHY, SECRETARY.

#### SAGINAW COUNTY.

The annual meeting of the Saginaw County Medical Society was held at the City Hall, March 19, 1914, with a large attendance.

Dr. Arthur Grigg of Saginaw exhibited several patients presenting various stages in treatment by radium, and also exhibited some radium.

Dr. Geo. E. Fay, of Detroit, presented a splendid paper on "Fractures."

Officers were elected as follows:

Pres.—Dr. Robert McGregor, Saginaw.

Vice-Pres.—Dr. W. A. DeFoe, Saginaw.

Sec'y-Treas.—Dr. A. R. McKinney, Saginaw.

Trustees—Dr. H. J. Meyer, Saginaw; Dr. J. D. Bruce, Saginaw; Dr. Arthur Grigg, Saginaw.

Delegates to State Meeting—Dr. Robt. McGregor, Dr. A. R. McKinney.

Mem. Medico-Legal Com.—Dr. W. J. O'Reilly, Saginaw.

A. R. MCKINNEY, SECRETARY.

### SOUTHWESTERN MICHIGAN TRIOLOGICAL SOCIETY

The sixth regular meeting of the Southwestern Michigan Triological Association was held in Ann Arbor, Monday, April 6th, Dr. E. J. Bernstein, the president, in the chair.

The meeting consisted of clinics, Dr. Walter R. Parker doing a cataract operation, a trephining for detached retina, an advancement of the internal rectus, and an enucleation. After the operative work he presented about twenty-five patients, giving the case histories and giving the members an opportunity to examine the patients. Among those presented were a case of pseudo-papillitis, the disc being typical, but the balance of the eye ground being apparently normal. Also a case of mic-ophthalmus with congenital coloboma of the iris ciliary body choroid and retina in both eyes. Also a case of paralysis of the right inferior oblique muscle, a case of central tumor with accompanying papillitis of five dioptries.

Dr. Canfield did two submucous resections of the nasal septum, and two mastoid operations. Dr. Canfield also presented about twenty cases showing mastoids in various stages of recovery, besides several other cases for diagnostic study and two cases convalescing from frontal sinus operations.

There were present at the meeting from out of town, Drs. Paterson and Roller of Grand Rapids; Bird of Flint; Buck of St. Johns; Obert of Jackson; Bernstein, Grant and Wilber of Kalamazoo; and Colver, Carling and Haughey of Battle Creek.

The next meeting will be held in Battle Creek, May 4th.

WILFRED HAUGHEY, SECRETARY.

### TRI-COUNTY.

The regular meeting of the Tri-County Medical Society was held in the Club Rooms at the Court House at Cadillac, April 2, 1914. Dr. B. R. Corbus of Grand Rapids had been extended a special invitation and was the guest of the evening.

By a unanimous vote the Society decided to entertain the members of the Traverse Co. Med. Soc. together with their ladies, in a most suitable time and manner, in the near future. A conclave of this kind should clinch harder than ever the good feeling and professional regard between the members of the two bodies.

The Society has decided to install a projection lantern suitable for both opaque and transparent slides, and feel that with its use and assistance the subjects presented in the future ought to be more beneficial and instructive than ever.

The paper of the evening was presented by Dr. B. H. McMullen of Cadillac, on the subject, "Diseases of the Stomach," special reference being made to ulcer. The wide experience of the essayist was shown throughout the whole.

Dr. Corbus, whose special work lies in direct line with the subject presented, opened the discussion and elucidated in a very elaborate manner the various phases already dwelt upon by Dr. McMullen. Needless to say, his remarks were of utmost value as they brought before the members of the society the more recently advanced theories. The experience meeting which followed, in which more light upon questionable points in diagnosis was called for, by the various members was ample proof of the fact that the presence and talk of Dr. Corbus was very much appreciated.

By a unanimous vote the Society expressed its thanks and appreciation of Dr. Corbus for coming to

Cadillac and giving us this splendid discussion, as well as for good fellowship.

At a special meeting of the Society, held April 14, Dr. Reuben Peterson of Ann Arbor was the special guest. He presented a paper on "Eclampsia," and all who have followed Prof. Peterson's work in this regard can appreciate the value of the subject. It is needless to go into details as to the attitude taken and the line of reasoning followed as all students of medicine are well aware of this. At the close of the paper, there was almost no room for a doubt among those present as to the course to follow in Eclampsia. The discussion which followed, in which every one present partook, was of decided interest. Many ideas, opposing those given by Prof. Peterson were referred to, only to strengthen Prof. Peterson's views.

By a unanimous vote the Society expressed its gratitude to Dr. Peterson for his presence and paper. We appreciate when our friends from out of the county favor us with their presence, and present papers. Much is accomplished in this manner both in the way of furthering the ideas of individual members as well as forming a closer tie of fellowship between the Societies and outside world.

RUDOLPH J. E. ODEN, SECRETARY.

### TUSCOLA COUNTY

The regular meeting of the Tuscola County Medical Society was held in Caro, April 13th, 1904 at 2 P. M., twelve members and five visitors being present.

Dr. Wm. Morris reported a case cystic stone occurring in a two and a half year old boy.

The following papers were read and will be sent to *The Journal* at a later date.

"Some Common Ocular Conditions, their Diagnosis and Treatment," by A. R. McKinney of Saginaw.

"Osteomyelitis: The Value of an Early Diagnosis and Treatment," by Dr. W. A. Hoyt of Ann Arbor.

"Pituitrin in Obstetrics," by Dr. W. F. Seeley of Ann Arbor.

The following resolution on the death of Dr. Deming of Cass City was adopted.

"Resolved by the Tuscola County Medical Society, that in the death of Dr. Daniel P. Deming, our oldest member and a practitioner of the county for forty years, we have lost a dear friend. He was a very loyal member, always enthusiastic in the society's work and ever ready in its discussions and deliberations. No distance was too great, or weather too severe to prevent his prompt and regular attendance. His companionable nature and ready wit made association with him a great delight.

To his family and relatives we extend our heartfelt sympathy in their great bereavement. Be it further

Resolved, that a copy of these resolutions be placed among the records of this society, a copy be sent to his family and a copy be published in *The Journal of the M.S.M.S.*"

W. C. GARVIN, SECRETARY...

### WAYNE COUNTY.

#### Program

Monday, March 23—Surgical Section.

Appendicitis—Complications and Treatment. C. D. Brooks.



Monday, March 30—General Meeting.  
 Sterility—Its cause, and treatment with an original stem pessary. C. Hollister Judd.  
 Intravenous Anaesthesia. C. L. Candler.  
 Monday, April 6—Medical Section.  
 Nitrogenous Retention in Chronic Nephritis. Walter A. Hewlett.  
 Monday, April 13—Medical Section.  
 Cardiac Arrhythmias—With special reference to the non-instrumental recognition.—Lantern slides. W. J. Wilson, Jr.  
 The Hospitals of Europe—Lantern slides. William B. Shatton.  
 Monday, April 20.  
 Joint Meeting—Retail Druggists with Wayne County Medical Society. James W. Helme, State Dairy and Food Commissioner.  
 Delegates to the State Convention to be held at Lansing:

## REGULAR

E. B. Smith  
 J. E. King  
 L. J. Hirschman  
 J. W. Vaughn  
 H. R. Varney  
 A. W. Blain  
 C. W. Stockwell  
 Fred Cole  
 W. D. Ford  
 Guy Conner  
 E. K. Cullen

## ALTERNATE

J. N. Bell  
 John Dodds  
 Rollin Parmeter  
 G. P. Myers  
 F. B. Walker  
 P. M. Hickey  
 E. G. Martin  
 C. E. Simpson  
 M. V. Meddaugh  
 F. B. Tibbals  
 C. H. Oakman  
 J. Van Amberg Brown  
 R. L. CLARK, SECRETARY.

## Book Reviews

TEN SEX TALKS TO GIRLS.. (14 years and older.)  
 By Irving David Steinhardt, M.D. Instructor in Clinical Surgery Cornell University, New York, 193 pages, 6 illustrations, 12 mo. Cloth, \$1.00 net. J. B. Lippincott Co., Philadelphia.

This book is a compilation of the author's talks delivered before several New York organizations and later published in the New York Medical Journal. It discusses matters pertaining to sex and the sexual relations in a plain, understandable way, imparting very clearly and properly the information which every young girl should possess.

The discussion of, and the enlightening of those topics of vital importance to every maturing female, is no longer tabooed. The false-modesty of the past is properly condemned, and the necessary, essential information and instruction is being given.

Mothers and motherless girls realize the necessity of possessing this information. They often come to the physician seeking the truth. To all such who thus consult you we recommend that you instruct them to secure this work. You will thus assist materially in relegating to the past the barrier that has caused so much of sorrow, heart aches and trouble. We wish every physician in Michigan might read and own a copy of this volume.

DEVELOPMENT AND ANATOMY OF THE NASAL ACCESSORY SINUSES IN MAN. Based on 290 lateral nasal walls, showing the various stages and types of development from the sixtieth day of fetal life to advanced maturity. By Warren B. Davis, M.D., Corinna Borden Keen Research Fellow, Jefferson Medical College, Philadelphia. Octavo of 172 pages with 57 original illustrations. Philadelphia and London: W. B. Saunders Company, 1914. Cloth, \$3.50 net.

This book is based on the study of 290 nasal walls, presenting the anatomy and physiology of the nasal accessory sinuses from the 60th day of fetal life to advanced maturity. It is an original and personal work of the author and is a most meritorious contribution to the literature on this subject. He has accomplished his purpose of showing the various stages of the development of the sinuses and reduced his observations to a practical value.

Difficulty in securing bodies of children between the ages of two and sixteen necessitated a development of a technic by which the accessory sinus areas could be removed en masse and permit reconstruction of the face without marked deformity. This he accomplished and imparts the technic in this publication. The tables of averages, giving one the age, size of the ostia, origin, thickness of the septum, and anterior and posterior walls, vertical, lateral and posterior diameters and relation to the nasal floor all form valuable features of the work. It is an excellently gotten up book. It fills that niche which no other work does.

MEDICAL GYNECOLOGY. By S. Wyllis Bandler, M.D., Adjunct Professor of Diseases of Women, New York Post-Graduate Medical School and Hospital. Third Thoroughly Revised Edition. Octavo of 790 pages, with 150 original illustrations. Philadelphia and London: W. B. Saunders Company, 1914. Cloth, \$5.00 net; Half Morocco, \$6.50 net.

A work for the general practitioner imparting the best and latest accepted forms of medical treatment for those trying conditions which do not call for operative interference. Diagnosis, symptomatology, and microscopic findings are taken up in each subject treated upon. Many valuable prescriptions are given. Constipation deservingly is given consideration in 40 pages of the text. Venereal diseases are covered in some 100 pages. Nervous diseases as the result of disease of the female generative organs is covered in a monograph of some 50 pages. The importance of internal secretions is elaborated upon and their relation to gynecological conditions is ably considered.

The reader is instructed how to recognize early the non-medical cases, and frankly points out the necessity of early operative interference. While in some cases over-conservatism predominates and valuable time is lost in recommending medicinal treatment in place of the good that conservative surgery will bring, still, on the whole, the book is to be commended. It is practically a necessity for the practitioner. It is a satisfactory result of conscientious effort of the author.

CHEMICAL PATHOLOGY. Being a Discussion of General Pathology from the Standpoint of the Chemical Processes Involved. By H. Gideon Wells, Ph.D., M.D., Professor of Pathology in the University of Chicago and in Rush Medical College, Chicago. Second Edition, thoroughly revised. Octavo of 616 pages, Philadelphia and London: W. B. Saunders Company, 1914. Cloth, \$3.25 net.

This work considers pathology from the standpoint of the chemical processes involved. It deals with the chemical changes which take place in pathologic conditions. It treats of the causes of disease, and so provides the first step in their treatment. It discusses the cell; the enzymes, their nature and action; autolysis; chemistry of bacteria and parasites and their products; immunity, agglutinins, precipitins, toxins, antitoxins, phyto-toxins, zoötoxins, hemolysis, serum cytotoxins; inflammation, blood diseases, edema, retrogressive processes (necrosis, cloudy swelling, gangrene, rigor mortis, various degenerations, etc.); calcification, pigmenta-

tion, tumors, metabolism, uremia, gout, diabetes, auto-intoxication, ductless glands. The introductory chapter presents the theories of the composition of proteins, ionization, diffusion, osmotic pressure, etc.

The volume fills a need in our literature. As a second edition it is an improvement over the first volume and is brought down to the accepted present day opinions attained by changed views and added knowledge. It is fully abreast of the times.

**A MANUAL OF CLINICAL DIAGNOSIS BY MEANS OF LABORATORY METHODS.** For Students, Hospital Physicians, and Practitioners. By Charles E. Simon, M.D., Professor of Clinical Pathology and Experimental Medicine in the College of Physicians and Surgeons, Baltimore. Eighth edition, enlarged and thoroughly revised. Octavo, 809 pages, with 185 engravings and 25 plates. Cloth, \$5.00 net. Lea & Febiger, Philadelphia and New York, 1914.

That this is generally recognized as the leading work on Clinical Diagnosis is shown by the demand which has carried it to its eighth edition. Such success indicates that it has won the hearty approbation of the profession; and this can result only from intrinsic merit of a high order. In this new edition will be found the advances which the last two years have brought forth. They are of great interest and importance. The account of the diagnostic methods based upon the appearance of the protective ferments of Abderhalden in the blood will be found up to date and, it is believed, a trustworthy guide for those who would venture into the attractive field of "organ diagnosis." Much of the technic in connection with the Wassermann reaction has been rewritten. The applicability of the complement fixation test to latent gonococcus infections having been satisfactorily established, the corresponding technic has been embodied in the present edition and should prove useful in many cases. The more modern methods of investigating the existence and extent of renal disease have been carefully considered, and should receive the attention of both the general practitioner and the laboratory worker. They are thoroughly practical, and should be employed as a matter of routine in the study of the corresponding diseases.

A very excellent and practical feature will be found in the second part of the volume, entitled "The Essential Factors in the Laboratory Diagnosis of Various Diseases." This section of 250 pages is devoted to the application of laboratory findings to diagnosis; and under the various diseases, which are alphabetically arranged, are given the essential points of diagnostic significance. This feature is unique in books on the subject.

In the new edition the text has been increased by about thirty pages, and a number of new illustrations have been added. The colored plates are exceptionally fine.

Commended most unhesitatingly. An excellent work for every practitioner and laboratory worker.

**A TREATISE ON DISEASES OF THE SKIN.** For the use of advanced Students and Practitioners. By Henry W. Stelwagon, M.D., Ph.D., Professor of Dermatology, Jefferson Medical College, Philadelphia. Seventh edition, thoroughly revised. Octavo of 1250 pages, with 334 text-illustrations, and 33 full-page colored and half-tone plates. Philadelphia and London: W. B. Saunders Company, 1914. Cloth, \$6.00 net; Half Morocco, \$7.50 net.

The seventh, reset edition of this work which has occupied the distinct position as being the exponent of American dermatology; a reference work and

text book is offered to the profession. Carefully compiled, clear in description, conservative and revealing the accurate observation and judgment of the author merits its cordial reception. Featured by reason of emphasis made of diagnosis and treatment, and numerous valuable illustration, the book becomes an actual necessity for every library. Every phase of the subject is carefully considered, while syphilis, pellagra, tropical affections, hook-worm and impetigo receive increased attention. An important section of 50 pages is devoted to falling hair and baldness and their treatment.

The study of this work will enable you to apply the latest and best in dermatological disease. Authors and publishers are deserving of the professions' congratulations.

**THE PRACTICE OF PEDIATRICS.** By Charles Gilmore Kerley, M.D., Professor of Diseases of Children, New York Polyclinic Medical School and Hospital. Octavo of 878 pages, 139 illustrations. Philadelphia and London: W. B. Saunders Company, 1914. Cloth, \$6.00 net; Half Morocco, \$7.50 net.

This new book is a complete work on the practice of pediatrics—bacteriology, pathology, diagnosis, symptomatology, treatment, with by far the greatest attention given to diagnosis and treatment. One point regarding treatment is this: When age has any bearing upon the course of treatment, the treatment for different ages is clearly indicated. This is very important.

The first chapters of the work are devoted to such general subjects as clothing for the infant, bathing, management, sick-room, etc. Then follow chapters on the newborn and its diseases, the feeding and growth of the baby, the care of the mother's breasts, artificial feeding, milk modification and sterilization, diet for older children. Then are discussed systematically and in detail every disease of childhood, telling just what measures should be instituted, what drugs given, and in many cases valuable prescriptions are included.

The chapter on Vaccine Therapy is right down to the minute, including every new method of proved value—with the exact technic.

There is a large chapter devoted to therapeutic measures other than drugs, and an excellent chapter on Gymnastic Therapeutics, giving explicit directions for the correction of certain abnormalities in which gymnastics have proved efficacious.

#### CONDENSED TABLE OF CONTENTS.

- General Considerations.
- Examination and Diagnosis.
- Diseases of the Newborn.
- Mouth and Esophagus.
- Stomach, Intestines, Peritoneum.
- Rectum and Anus.
- Spleen and Liver.
- Respiratory Tract.
- Heart.
- Blood.
- Glandular System.
- Urogenital System.
- Nervous System (nervous and mental diseases of children.)
- Skin.
- Ear.
- Transmissible Diseases.
- New Diagnostic Methods.
- Vaccine Therapy.
- General Diseases.
- Suggestions on Management.
- Therapeutic Measures Other than Drugs.
- Gymnastic Therapeutics.
- Drugs and Drug Dosage.

This is the author's compliance with numerous requests that he produce a comprehensive work on diseases of children, and he has responded ably. It is a safe and valuable guide and certain of receiving the stamp of approval from all pediatricists. The publishers mechanical work is of high standard and enhances the value of the volume.

**ELECTRICITY IN DISEASES OF THE EYE, EAR, NOSE AND THROAT.** By W. Franklin Coleman, M.D., M.R.C.S. Eng.; ex-Pres. and Prof. of Ophthalmology in the Illinois School of Electro-Therapeutics; etc. Octavo; 595 pages; illustrated. Chicago, Courier Herald Press, 1912.

The author presents a very readable and comprehensive compilation of his personal experiences together with the reported findings and attitudes of many other workers in the electro-therapeutic field of special practice. There is an excellent section on the physics of electricity and electrical apparatus. The therapeutics and diagnostic uses of electricity with various types of currents, lights, ozone, etc. are taken up exhaustively under sections on the Eye, Ear, Nose and Throat. These sections are of great interest to the specialist regardless to his attitude toward the conclusions drawn.

The book will find a very proper place in any medical library.

We cannot agree with the author that Electro-Therapeutics will ever "to a considerable extent supplant surgery and treatment by drugs."

**THE JUNIOR NURSE.** By Charlotte A. Brown, R. N., Instructor in the Boston City Hospital; Graduate of the Boston City Hospital and Boston Lying-in Hospital Schools for Nurses; late Superintendent of the Hartford Hospital Training School, Hartford, Conn. 12 mo, 208 pages, illustrated. Cloth, \$1.50, net. Lea & Febiger, Publishers, Philadelphia and New York, 1914.

Brown's Junior Nurse is a volume which should be read and kept for reference by every one who enters upon the course of training for the nursing profession. It is full of valuable information which is particularly useful to the beginner, and which is sure to be of service not only through the entire course in the training school, but afterwards in actual nursing of any kind. The book is characterized by clearness and simplicity. In the presentation of each topic the clinical features are emphasized throughout. The volume opens with chapters on the Qualifications of the Nurse, and her Personal Hygiene, on Bed Making and the Admission of Patients. Then follow discussions of all of those subjects, a knowledge of which is necessary for the discharge of the nurse's everyday duties. The sections on Bandaging, on Emergencies and on Infectious and Contagious Diseases are worthy of special attention. A convenient glossary is placed at the end of the volume. The illustrations are extremely helpful, especially those in the section on bandaging.

If you are on the training school committee of your hospital you will do well to add this book to your list of recommended text books for nurses.

**A MANUAL OF INFANTILE PARALYSIS WITH MODERN METHODS OF TREATMENT.** Including reports based on the treatment of 3000 cases. By Henry W. Frauenthal, A.C., M.D., Surgeon and Physician in Chief New York Hospital for Deformities and Joint Disease; and J. V. V. Mauning, M.D., Epidemiologist, Wisconsin, 1908. Illustrated with more than 100 original engravings. F. A. Davis Co., Philadelphia. Price \$3.00.

This compilation of the authors' experience with acute poliomyelitis is free from an abundance of technical terms and presents to every physician a most excellent manual and one that may be placed in the hands of the more intelligent parents.

It is an able discussion of this disease and covers its every phase. It is a most welcome addition to the literature upon this subject. It deserves nothing but commendation.

## Miscellany

**THE ABSORPTION OF IRON FROM MINERAL WATERS.** It is now generally admitted that both forms, organic and inorganic, of iron compounds can be absorbed and satisfactorily carry out the purposes for which they are ordinarily administered. Recent investigation has shown that iron salts are absorbed from natural waters (chalybeate waters) in which they occur and there is no reason for supposing that these cannot facilitate hemopoiesis and hemoglobin formation, if there is a deficiency in the iron-containing component of the blood, precisely as medicinally administered iron may. They seem to possess no advantage, however, over the latter (*Jour. A.M.A.*, March 14, 1914, p. 856).

**THE DANGER OF CROTALIN.** A death from infection from the use of crotalin is reported by J. F. Anderson of the U. S. Public Health Service. Out of 95 ampules of crotalin solution, from four different manufacturers, 35 were found to be contaminated; further, 12 tablets were examined and all found to be contaminated. It was demonstrated that there was a variation in the activity of different lots of crude venom and also in the solutions prepared by the same or different manufacturers. The report emphasizes the dangers of the use of rattlesnake venom or crotalin for the treatment of epilepsy (*Jour. A.M.A.*, March 21, 1914, p. 934).

**MERCURIC CHLORID AND THE PUBLIC.** In commenting on the use of mercuric chlorid tablets by the public and on the attempts to check this by special legislation, M. I. Wilbert points out that the exploitation of this drug under non-descriptive titles such as "antiseptic tablets" is partially responsible for their indiscriminate use. The fact that they are given a distinctive shape or color does not serve to protect the purchaser if he is uninstructed as to contents; instead it tends to elaborate on the misuse of the tablets. Physicians are to some extent responsible for the public use of tablets of corrosive mercuric chlorid, for in the past, these tablets have been prescribed or given to patients for antiseptic purposes without sufficient precaution as to their poisonous character (*Jour. A.M.A.*, March 28, 1914, p. 1042).

**RADIUM AND ETHICS.** Reforming to enthusiastic statements by physicians relative to the curative value of radium emanations, the *Edinburgh Medical Journal* asks if there is much difference between the advertisements of any catch-penny patent cure-all and such announcements. It is pointed out that the public is only too ready to believe any tale as to the value of radium as a cure for gout, rheumatism and cancer and hence the medical profession should absolutely refrain from publicly encouraging such notions (*Jour. A.M.A.*, March 28, 1914, p. 1044).



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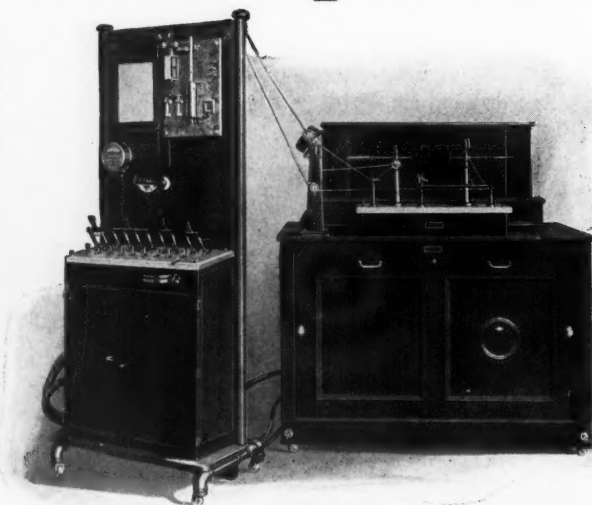
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